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Comparative analysis of benefits received from Naval Air Station Search and Rescue (SAR) mission

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by

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Outsourcing is one method the Department of Defense is actively pursuing in order to cut costs and fund its planned modernization. This thesis investigates the question of whether the U.S. Navy should outsource the SAR mission at Naval Air Stations. The overarching question of whether or not SAR is an "inherently governmental" function was considered as was the alternative possibility of competition, if it were a "commercial" function.

This thesis is designed to complement other ongoing analyses by concentrating on the non-direct cost issues. A direct cost analysis of this outsourcing initiative is not conducted in this thesis. This thesis, therefore, examines the gross benefits received by the U.S. Navy as a result of the SAR mission at Naval Air Stations. These benefits were categorized for analysis as personnel rotation-base, personnel experience-base, mission related and public related.

A Decision Support System Generator using the Analytical Hierarchy Process was introduced in the study as an experimental methodology for evaluating the benefits received by the Navy. Consistent results were obtained from two separate groups and insights were obtained for future improvements in these experimental techniques. There is also a discussion of how the Analytical Hierarchy Process might be extended to evaluate net benefits (that is, benefits minus costs) to the Navy.

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Outsourcing is one method the Department of Defense is actively pursuing in order to cut costs and fund its planned modernization. This thesis investigates the question of whether the U.S. Navy should outsource the SAR mission at Naval Air Stations. The overarching question of whether or not SAR is an "inherently governmental" function was considered as was the alternative possibility of competition, if it were a "commercial" function.

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I. INTRODUCTION

A. BACKGROUND

The budget authority for the Department of Defense (DOD) decreased by forty percent between 1985 and 1997 (in terms of '97 dollars). Additionally, the fiscal year '97 defense budget as a percentage of our country's gross domestic product (GDP) was the lowest it has been within the last forty-five years at 2.8%. These figures illustrate the fiscal pressures that the Department of Defense (DOD) is under to continue operations and plan for future modernization. In response, DOD has established goals to save billions of dollars through various initiatives. Outsourcing work to the private sector is seen as one of DOD's key methods toward achieving these cost savings in order to fund much of its modernization during the next five years.

New initiatives for possible cost savings have been proposed for the performance of those tasks that have been traditionally military functions, or what might be considered as core competencies. Among these initiatives is the possible outsourcing of the Search and Rescue (SAR)

mission at certain naval air stations. This would require contracting helicopter services from a commercial provider to fulfill the SAR mission at each of the affected air stations.

B. OBJECTIVES AND RESEARCH QUESTIONS

This thesis investigates the question of whether the U.S. Navy should outsource the SAR mission at naval air stations. In the investigation, this thesis has two objectives. The first objective is to determine whether or not the SAR mission at naval air stations, in terms of OMB Circular A-76, is an inherently governmental function. The secondary research questions for this objective are:

(1) Is SAR a Core Function of the U.S. Navy?

(2) Is the SAR mission at naval air stations in competition with the commercial sector?

The second objective is to answer the question: What are the economic implications that are not associated with direct unit costs in outsourcing the naval air station SAR mission? The secondary research questions for this objective are:

(1) Can the "difficult to measure" capital investments in:

(a) experience base,

(b) rotation base,

(c) missions and collateral tasks,

be included in the determination of "best value" to the government?

(2) Would these investments be lost in a "conversion to contract?"

C. SCOPE AND LIMITATIONS

1. Scope

This study is divided into two major parts. First, the relative importance of the SAR mission to the U.S. Navy is shown through analysis of operational requirements, accomplishments and missions. Second, "difficult to measure" capital investments are determined. This was done utilizing two examples of helicopter outsourcing as well as the operations and missions of two West Coast naval air stations.

It is anticipated that CNA (Center for Naval Analysis) will perform a direct cost analysis of outsourcing the naval

air station SAR mission. The research effort contained in this thesis is aimed at complimenting this type of cost analysis. As such, direct unit costs are not considered in this analysis.

2. Limitations

Analyzing each of the naval air stations that would be effected by a decision to outsource SAR is beyond the scope of this thesis. It is noted that different operating environments and proximity's to other federal and civil SAR agencies that may exist at individual air stations could lend themselves to other SAR alternatives, but the principals derived in this thesis concerning outsourcing should apply universally.

Experimental questionnaires were utilized in conjunction with the Analytical Hierarchy Process methodology to determine the relative importance of benefits to the U.S. Navy. This process was performed to demonstrate the utility of decision support system generators as a tool to quantify the benefits received from the SAR mission. The

questionnaire and the subsequent analysis did not consider any direct costs associated with performing the SAR mission.

D. METHODOLOGY

A wide variety of references as well as personal interviews were used in the collection of data for this thesis. DOD joint publications as well as those of the Navy were used to ascertain policy and operational requirements placed on the SAR providers at naval air stations. Individual interviews were utilized to determine the personnel manning levels and job evaluations of the SAR providers at Naval Air Station (NAS) Lemoore and NAS Fallon. Historic data collected from the Commander Naval Air Force Pacific Fleet (CNAP) SAR Model Manager's office and personal interviews with SAR program evaluators and instructors were used in establishing the relative importance of the "rotation" and "experience" base.

E. ORGANIZATION OF STUDY

This thesis is divided into six chapters. Chapter II provides general background information concerning SAR, naval helicopter communities, outsourcing and the core functions of the U.S. Military. Chapter III provides

general information about the Navy's eleven air stations which maintain organic SAR assets and specific information about two west coast stations, NAS Lemoore and NAS Fallon. The information in Chapter III is organized under the broad headings of Air Station, Missions and Personnel. Chapter IV gives the background and highlights comparable issues from two recent helicopter outsourcing decisions involving the U.S. Navy. The first concerns the outsourcing of the vertical replenishment mission onboard Military Sealift Command (MSC) vessels. The second is the transition from navy helicopter support to contract helicopter services in support of the National Science Foundation (NSF) Antarctic Research Program. Chapter V focuses on three aspects of the analysis of SAR outsourcing. The first aspect is an analysis of benefits to the navy associated with the organic SAR assets and quantified through the use of EXPERT CHOICE™ Decision Support Software. The second aspect is the relative amount of time spent on SAR mission support, special tasking and collateral duty assignments by the navy personnel assigned to provide SAR at NAS Lemoore and NAS Fallon. The third aspect is a comparison of annual SAR

evaluation exam scores between the station SAR units and operational squadrons. The final chapter summarizes the evidence presented in this thesis, it also provides concluding remarks and makes recommendations for further investigations needed to complete the investigation of this issue.

II. BACKGROUND

A. INTRODUCTION

This chapter provides the general background information in order for the reader to gain a more full understanding of both the SAR mission within the Navy and the climate in which the decisions to outsource are being made. First, the SAR mission is described in terms of the root document, the National SAR Manual. Then the general requirements of the Navy and practices of civilian SAR providers are addressed.

The climate within the Navy as issues of future helicopter missions and requirements are addressed can best be understood in light of the Navy's planned helicopter structure as detailed in the Helo Master Plan. The requisite information concerning the naval helicopter communities, their missions and current aircraft is also presented to help the reader more fully understand the current and future dynamics involved.

Next, the fundamental principles of outsourcing are presented along with current DOD applications and policies.

The definitions of key outsourcing terms within the DOD is provided in Appendix A.

Finally, a discussion of core functions is provided to help the reader understand the issues at stake as decisions are made which determine the content of the DOD core functions.

B. SAR

1. National SAR Manual

The National Search and Rescue Manual is a DOD Joint Publication that was prepared under the direction of the Interagency Committee on Search and Rescue (ICSAR). Federal agencies such as: DOD, Department of Transportation, Department of Commerce, Federal Emergency Management Agency, Federal Communications Commission, National Aeronautics and Space Administration (NASA), and Department of Interior, are members of this interagency committee which is sponsored by the U.S. Coast Guard.

Both military and civilian federal agencies that support civil SAR operations receive guidance concerning implementation of the National Search and Rescue Plan from this manual [Ref. 1]. This manual is also widely viewed

among both international organizations and this country's state, local and private SAR organizations as the basic reference manual. The manual consists of two volumes. " Volume I, National Search and Rescue System" gives the details and procedures for all five major stages of a SAR; awareness, initial action, planning, operations and mission conclusion. The second volume, " Planning Handbook" provides planning data, charts, templates and checklists which are organized around the five stages defined in Volume I.

2. National SAR Plan

The National Search and Rescue Plan was designed to integrate available SAR facilities within any single area into a coordinated and cooperative network managed by a single federal agency. In accordance with international agreements, the areas in which the U.S. is responsible for providing SAR are divided into three areas; Inland, Maritime and Overseas. The appropriate overseas unified command or Alaskan Air Command is responsible for the Overseas Area and the U.S. Coast Guard is responsible for the Maritime Area. The Inland Area, defined as the continental United States,

except Alaska, and waters under the jurisdiction of the U.S, is assigned to the U.S. Air Force. These agencies act as the SAR Coordinator for their respective areas.

Operating under the principle that " all available" resources should be used to respond to cases of persons and property in distress, Rescue Coordination Centers (RCCs) can utilize federal, state, local and private resources. This principle is due directly to the fact that no single U.S. organization has sufficient SAR resources to adequately meet the potential demand.

3. Military versus Civilian SAR

SAR is defined as the use of available resources to assist persons and property in potential or actual distress. DOD components must provide SAR facilities for their own operations. These facilities may also be used for civil needs on a not-to-interfere basis with military missions. [Ref. 2] In the private sector many helicopter services exist as providers of various services, but very few can be considered search and rescue specialists. The closest analogue in the private sector is the Helicopter Emergency Medical Evacuation (HEME) services which specialize in

ambulance type service and are generally contracted to specific medical care facilities.

A key issue between military and civilian SAR is the ability to perform external lifts of personnel. There are two methods utilized, the first is hoisting personnel via a winch to and from the surface in areas the helicopter cannot land. Second is the capability to rappel from the helicopter and utilize a static line and a short-haul technique to move ground personnel to the nearest suitable location where assistance can be gained. These methods are practiced by Navy SAR crews and the qualification and currency requirements are governed by Navy standardization policies. For the civilian contractor, these are considered specialized services and require certification through FAR (Federal Aviation Regulation) Part 133, Rotorcraft External-Load Operations and Part 135, Operating Requirements: Commuter and On-Demand Operations. The cost for a civilian contractor to train and demonstrate proficiency associated with meeting the FAR requirements for external lifting of personnel (Class Delta certification) is generally too costly for the private sector. If a contractor is

specifically required to provide services that require lifting of personnel which would allow them to be compensated for the additional costs of certification, they would be more likely to pursue certification. The economic implications surrounding the certification of civilian helicopter contractors to perform this defining SAR function may act as a sort of " barrier-to-entry" into this market.

Typically, the helicopters that are specialized to provide SAR services belong to the state and local public agencies such as county sheriff's offices, parks services, fish and game and forestry organizations. These public agency assets are normally provided in areas where the topography and public-use land creates a specific need, but like many public services the assets are usually spread quite thin. Like private contractors, these public agencies rarely have the capital to invest in becoming FAA certified to perform external lifts of personnel. The only way to reach people on the ground, then, is by landing.

C. NAVY HELICOPTERS

1. Naval Helicopter Communities/Missions/Aircraft

Traditionally, U.S. Navy helicopters have been divided into four separate communities or warfare specialties. These are HS (helicopter anti-submarine warfare - carrier based), HSL (helicopter anti-submarine warfare light - escort ship based), HC (helicopter combat support- logistics and utility), and HM (helicopter mine countermeasures). Each of these communities performs different missions with different types, models, and series of helicopters. The following descriptions are given in order to familiarize the reader with these mainstream helicopter communities, their missions and helicopter types.

The HS Community performs anti-submarine warfare (ASW) and SAR missions in support of aircraft carrier operations. Until 1990, the HS community utilized the H-3 to perform its mission and, now, has fully transitioned into SH-60F and HH-60H aircraft. The SH-60F is the electronics equipped platform from which ASW is performed and the HH-60H is utilized for utility and combat SAR (CSAR) missions. The HS

squadron deploys onboard aircraft carriers as a complete unit.

The HSL Community which first deployed in 1970 consists of an integrated helicopter-ship system called LAMPS (Light Airborne Multipurpose System) that is specifically designed as an over-the-horizon antisubmarine-antiship search and strike platform. The Kaman SH-2D/F/G and Sikorsky SH-60B aircraft make up the LAMPS MK I/LAMPS MK III team and deploy aboard frigates, destroyers, and cruisers. The H-2's and LAMPS MK I are no longer utilized in active-duty squadrons, but are maintained and utilized by naval reserve squadrons. LAMPS detachments are often utilized in the drug interdiction mission as well as their designed combat role.

The HC Community performs battle group logistics functions such as personnel movement, rapid airborne delivery of materials through Vertical Replenishment (VERTREP) and Vertical On-board delivery (VOD), day/night amphibious SAR, Special Warfare Support, and general utility. These missions are accomplished primarily with the H-46, CH-53 and H-3 helicopters utilizing a detachment concept deployment schedule from the shore-based squadron.

The HM Community utilizes MH-53's to perform minesweeping operations. The HM squadrons generally deploy as a unit which requires a very large amount of space to accommodate the large airframes and their accompanying mine countermeasure equipment used in the towing operations.

2. Helicopter Master Plan

In the 1990's, with the end of the cold war and a growing desire to downsize the military and reduce costs, the 600 ship navy goal has been eliminated. The associated requirement for helicopters has also decreased. The navy helicopter communities, subsequently, have needed to find a way to reduce the number of type, model and series of aircraft that they were operating in order to reduce costs. The plan to do this is called the Navy Helo Master Plan (HMP) and involves the HS, HSL and HC communities. The H-53 which supports the HM community and the VOD mission within HC is not immediately affected by the HMP.

The Navy HMP plans for a reduction to a "1.25 navy helicopter type, models and series" state of operations. That means that two models of the H-60 will be used, with each model being 75% support parts compatible with the

other. These two aircraft will be the Sikorsky CH-60 and SH-60R. In the future, therefore, the missions of the three communities will be accomplished by an H-60 variant.

D. OUTSOURCING

1. FUNDAMENTALS

When a manufacturing company is faced with a " make-or-buy" decision, it must determine whether it can purchase a certain part for less than what it would cost to produce that same part using its own production capabilities. In its simplest form, that is the same decision that service organizations are faced with when considering outsourcing. For both goods and services it is necessary to determine if the cost of doing business would decrease while producing equivalent or better results. Improvement of the process is always the goal, and it can be defined either by a better product at the same cost or by the same quality product at lower cost.

The decision to outsource either for goods or services is often a part of a company's long-run strategy. Some companies prefer to integrate vertically in order to maintain control of the activities which lead up to the end

product. Other companies may prefer to specialize in certain steps of the process while depending on outsiders for other steps that are part of the total process. Core competencies within a company are those steps or functions in which it chooses to specialize because it can perform them better than anyone else in that particular market.

Most outsource decisions are determined through methods of differential cost analysis as well as the consideration of issues not as easily quantified. These latter considerations include the internal aspects of the company's strategies and the external aspects such as reliability, quality and longevity of the outside providers. The company's strategies concerning quality, product, process, human resources, inventory, and maintenance and reliability can greatly influence an outsourcing decision.

2. Department of Defense Applications

Policies related to outsourcing are contained in OMB Circular A-76, Performance of Commercial Activities [Ref. 3]. The policy supported within the executive branch of the Federal Government is to " increase the use of commercially available items where practicable" [Ref. 4]. A-76

established the framework whereby the relative cost of performing commercial activity type work using Government employees versus contract services can be compared. As the pressure to reduce infrastructure costs has increased, the delineation between " commercial" activity and " inherently governmental" has become less defined.

The Office of Federal Procurement Policy (OFPP) is responsible for a policy letter providing guidance to Executive Departments and agencies on what functions are inherently governmental functions. OFPP Policy Letter 92-1, " Inherently Governmental Functions," which is Appendix 5 to the OMB Circular A-76 Revised Supplemental Handbook, provides this guidance. [Ref. 5] As part of OFPP Letter 92-1, a list of functions considered to be " inherently governmental functions" is given as well as guidelines for determining whether or not other functions may also be considered " inherently governmental." The list does not specifically identify SAR as an " inherently governmental function." Guidelines for determining whether it is " inherently governmental," are given under two categories, the exercise of discretion and totality of the

circumstances. Exercise of discretion refers to functions that not only make choices, but also to situations in which the authority to commit the Federal Government to a particular course of exists. Totality of the circumstances refers to the process of analyzing a number of factors associated with individual cases which are then judged against a set of given factors. In this process, the government Agency involved makes the determination of importance and applicability of the factors.

In addition to A-76, the policy of providing " best value" to the government is also a large part of the acquisition climate. Best value has untied the acquisition professionals from the mandate to accept " lowest cost." The " best value" solution focuses attention on measurable results through carefully formulating the acquisition strategy and contracting method. It also places more emphasis on past contractor performance by promoting best value rather than simply low cost in selecting sources for supplies and services [Ref. 6].

For example, in acquisitions where the requirement is clearly definable and the risk of unsuccessful contract

performance is minimal, cost may play a dominant role in source selection. On the other hand, past performance and technical ratings of the contractor would play a more dominant role in source selection when the requirements are less defined and a greater risk of performance exists.

E. CORE FUNCTIONS

The core functions of the military, like the core competencies in a business are those functions which by strategic design are so intertwined into the fabric of the organization that if removed would cause discontinuity in the overarching strategy of the organization. In terms of the A-76 program, core functions are inherently governmental and are not subject to outsourcing or privatization. Core functions are not in competition with the commercial sector and are performed by Government employees.

Under 10 U.S.C. 2464, the Secretary of Defense is required to define DOD's core functions. This code also mandates

> ...that DOD activities maintain a logistics capability (including personnel, equipment, and facilities) to ensure a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to a mobilization, national defense contingency situation or other emergency requirements [Ref. 7].

This core logistics capability that is government-owned and government-operated further defines the concept of " inherently governmental" functions.

DOD Core methodology is a relatively new process that is being used to ensure compliance with U.S. Code 2464. The process begins with JCS Scenarios as the force guidance and then proceeds to work in reverse through an established methodology which utilizes manhours to express core capabilities. The weapon system or platform specific capability is then quantified such that wartime readiness and sustainability requirements are met.

III. NAVAL AIR STATIONS

A. AIR STATIONS

All of the Navy's air stations are required to provide a SAR capability while conducting flight operations [Ref. 8]. Eleven of twenty air stations located in the U.S. (including Puerto Rico) and Cuba have organic personnel and assets to fulfill this requirement. Of the nine without organic assets, four receive SAR support from the organic SAR assets at nearby air stations. The remaining air stations utilize the capabilities of operational squadrons at or near them to provide their SAR protection.

In addition to Naval Air Stations, there are other facilities that require SAR coverage. These include the Naval Air Weapons Stations located at China Lake and Point Mugu, California and the Pacific Missile Range Facility at Barking Sands, Hawaii. These three facilities, because of the nature of their work and the diverse stakeholders they serve will not be included in this analysis. These facilities are also broken out as separate entities in the HMP's CH-60 integration plan [Ref. 9].

The eleven air stations with organic SAR capabilities are divided between the two coasts, three on the West Coast and eight on the East. The primary mission of SAR is the same at each of these stations. It is to provide SAR support for the base and its tenant commands. A secondary mission by nature of the availability of assets is to support the National Search and Rescue Plan as directed by the Area SAR Coordinator located at Langley Air Force Base (AFB), VA. SAR tasking other than military is performed on a not-to-interfere basis with military operations as determined by the Air Station Commanding Officer. In addition to SAR another commonality between the SAR units at these air stations is that each is provided 45-55 flight hours per month for training. With these training hours they maintain day, night and instrument currency as well as rescue swimmer and rappelling qualifications that may be necessary for their particular mission. Those units that have C-12 aircraft are given tasking from the U.S. Transportation Command which has assumed the coordination of all DOD personnel passenger transfers.

In addition to the common aspects of SAR stations given above, there are also unique features of each of the eleven SAR Stations. With exception of C-12 aircraft, the numbers in Figure 1 show the current status of aircraft and personnel assigned to fulfill the SAR mission at these stations. The C-12's at most of the air stations are supported by the SAR pilots either as pilots or in operations, scheduling or safety roles. The number of C-12 aircraft located at each station is provided in the figure as an indicator of the extent to which the SAR pilots are used in these support roles. The next section discusses the mission of the SAR units using three categories; SAR, Special and Collateral. The " SAR" category is apparent, but the " Special" category describes the other types of tasking that the SAR helicopters support. The " Collateral" category lists the collateral duty assignments of the SAR personnel which are in support of non-SAR related functions of the station. Within the SAR category three aspects of output are emphasized. These aspects are both the military and civilian SAR mission

SAR Station	type aircraft	No. owned	No. of officers	No. of aircrewman	No. of SAR corpsman	No. of non-flight enlisted
Whidbey Island	H-3 C-12 (note 1)	3 2	5	5	5 (note 2)	0 (note 3)
Fallon	H-1 C-12 (note 1)	3 1	6	6	5 (note 2)	0 (note 3)
Lemoore	H-1 C-12	3 1	6	9	5 (note 2)	15 (note 3)
Brunswick	H-1	2	7	10	3 (note 2)	10 (note 3)
Oceana	H-3	2	6	13	4 (note 2)	7 (note 3)
Patuxent River	H-3 C-12 (note 1)	3 3	9+2 (note 4)	15	5 (note 2)	8 (note 3)
Pensacola	H-3	3	6	12	5 (note 2)	35 (note 3)
Key West	H-3 C-12	3 1	5	7	4 (note 2)	18 (note 3)
Meridian	H-1 C-12	2 1	5	7	3 (note 2)	12 (note 3)
Corpus Christi	H-1	2	5	12	4 (note 2)	22 (note 3)
Guantanamo Bay	H-1 C-12	3 1	6	8	0 (note 5)	24 (note 3)

Note 1 - Helicopter maintenance is performed by contract personnel.
Note 2 - Hospital corpsman assigned in support of SAR are attached to the base medical facility where they are fully integrated into the staff. They are scheduled into the daily SAR alert crew and fly training missions to maintain proficiency and currency of qualifications.
Note 3 - These numbers reflect the number of personnel actually working in the SAR units. Administrative and supply rates such as PN, YN, AZ and AK are assigned to the base for support of the SAR unit and may not be included here.
Note 4 - Two pilots are civilian contract pilots.
Note 5 - Hospital corpsman assigned in support of SAR are attached to the base medical facility and are no longer required to support a SAR alert status.

Figure 1 -- AIRCRAFT AND PERSONNEL STATUS [Ref. 10]
(numbers reflect current state)

tasking as well as the other available SAR assets, private or public, that could provide the services to the community if the SAR unit was not available.

B. MISSIONS

1. NAS Whidbey Island, WA [Ref. 11]

a) SAR

This air station is home to the Navy's A-6 aircraft squadrons. The training missions as well as general air operations at the station are supported by a 15-minute SAR alert status between 0730 and 1630 weekdays and during FCLP's (field carrier landing practice), otherwise with a 30-minute alert status. The effective area of SAR coverage is 30,000 square miles [Ref. 12] of maritime and high elevation, mountainous terrain.

Over half of the SAR missions that the unit responds to are civilian [Ref. 13]. Since the Coast Guard maintains three H-65 Dauphine Helicopters at Port Angeles Coast Guard Group approximately fifteen miles away, they handle most of the civilian maritime SAR's. They also respond to military alerts, but the SAR unit will generally be able to respond more quickly to any alerts within seven

miles to the west of the air station as well as areas to the north and south of the station. The overland SAR capabilities of the unit make them the only possible alternative in many situations. The unit trains in what is referred to as " high angle" rescue techniques [Ref. 14]. This is a reference to the five possible methods of reaching a survivor in mountainous terrain. The urgency of the situation is normally dictated by the survivor's injuries, alternative solutions allowed by the surrounding terrain and the time elements of daylight, fuel and weather. Taking all these into account, the five methods are: (1) land the helicopter, (2) perform a " one-skid" touch-down, (3) hoist SAR crewman down, stabilize the survivor and hoist them back out, (4) rappel SAR crewman to the site to administer emergency medical care, and (5) use a " short-haul" method to get the crewman and survivor to the nearest location that allows better access. These techniques require constant training to maintain currency of qualification and proficiency.

Other SAR helicopter assets in the area include: Port Angeles Coast Guard Group, National Parks, Forest

Service and the Darien County Sheriff's Department. The Parks and Forest helicopters are generally used for searches, but technical rescues that require immediate medical attention as well as " high angle" rescues are done by the air station SAR unit. The Darien County Sheriff's department is located in the next county to the south of Whidbey and participates in searches in their proximity, but with no technical extraction or emergency medical personnel availability. There are two civilian medical airlift services in the area that are used for transport only.

b) Special

The helicopters are also used to support the Nanoose Torpedo Range.

c) Collateral

Duties that are accomplished by SAR pilots in support of the base are air operations, public affairs and public works. None of the SAR pilots are qualified in the C-12; its flight schedule is supported by other air station pilots.

2. NAS Fallon, NV [Ref. 15]

a) SAR

The base provides support for combat strike training for fixed and rotory wing communities through use of extensive range facilities and tenant training commands. The SAR unit provides twenty-four hour alert coverage seven days a week throughout the year. During hours of airfield operations the SAR crew maintains a 30-minute alert and after the airfield is closed, a 60-minute alert.

A notable SAR occurred at approximately 2000 one night in January of 1996 following the midair collision of two F/A-18 jets. It was a low illumination night and the primary SAR helicopter was launched within fifteen minutes of the alert and a second helicopter was launched within fifteen minutes of the first. A range spotter was also launched in a T-34 on night vision goggles (NVG's). After crossing two mountain ranges, both helicopters were in the valley where the wreckage was located and the T-34 was helping to direct their search tracks and clearance from one another. One survivor was picked up near the ejection site and the other was found in the aircraft wreckage suffering

severe injuries and hypothermia. Both survivors were at the medical facilities within ninety minutes of the mishap. The SAR helicopters are not equipped for NVG operations, but one aircrewman per aircraft will generally use a pair of goggles to aid in searching and obstruction avoidance. This represents the leading edge in helicopter SAR support with the possible exception of military combat SAR units. In general, night search and or rescue over mountainous terrain is not done in the private sector.

More than three quarters of the SAR reports filed for the last four years have been for civilian SAR. Generally, the county sheriffs departments will notify the station's Operations Duty Officer with the requests. The SAR crew is alerted and given the information and points of contact and simultaneously, the Area SAR Coordinator, Langley AFB, is contacted to determine whether the SAR unit is, in fact, the best asset to perform the mission. The Station's Commanding Officer grants permission to proceed based on availability in light of the prevailing military mission requirements.

The local civilian medical transport service, Care Flight, is based out of Reno, NV about 60 miles to the west. Occasionally, civilian medical evacuation (medevac) flights are requested of the SAR unit when Care Flight's two helicopters cannot meet the demand. Local Nevada county agencies do not have any air assets. Stead Army National Guard Base near Reno has H-60 helicopter units that are SAR capable, but are not trained or equipped for highly technical rescues and do not have medical aircrew.

b) Special

Range support missions are flown one or two times per month where Explosive Ordinance Disposal (EOD) personnel are flown around the range to check for unexploded ordinance. Approximately once per quarter, military communications personnel are flown to make repairs or adjustments to remote repeater sites.

c) Collateral

The senior SAR pilot is the station Executive Officer. Other SAR pilots perform duties in support of the SAR unit such as schedules, training, SAR/ NATOPS. One pilot also supports the base as the station Organizational

Effectiveness Center Officer. A second pilot is dual qualified and also supports the C-12 flight schedule.

3. NAS Lemoore, CA [Ref. 16]

a) SAR

The SAR unit maintains a 30-minute alert between 0730 and 1630 on weekdays and a 60-minute alert outside those hours for the airfield. The unit has a normal radius of coverage of 120nm (nautical miles) and has extended out to 140nm.

The SAR missions have been mostly civilian (more than 75%) during the past four years. The SAR alerts are typically received by the Air Operations Duty Officer directly from the Area SAR Coordinator at Langley AFB. The duty officer alerts the crew through their pagers and conducts information briefs. A large majority of the civilian SAR's come from Yosemite National Park. The parks service normally has two helicopters on contract during the busy summer months and all of the forest service helicopters are used for searches and low technical extraction's and transport. The high altitude, highly technical rescues and cases that need immediate medical attention are generally

referred to Lemoore's SAR unit. Whenever a rescue is made and further transportation to a medical facility is required, the SAR unit will land and transfer the survivor to a commercial medical transport such as the local area's Life Flight.

The largest commercial helicopter contractor in the central valley of California, Roger's Helicopters, is located in Fresno which is about thirty miles from Lemoore. This contractor has the capability of providing flight nurses and short hauls, but does not maintain this capability for short-notice SAR alerts.

b) Special

The helicopter crews are used occasionally for environmental impact studies in and around new construction areas on the base and aerial photography for the same purpose.

c) Collateral

Beside the billets directly involving the SAR and C-12 operations, the base Safety Officer and Air Schedules Officer jobs are held by SAR pilots. All of the pilots are

dual qualified and support both the C-12 and SAR flight schedules.

4. NAS Brunswick, ME [Ref. 17]

a) SAR

This air station is home to a number of active and reserve P-3 and C-130 squadrons. The SAR unit provides an alert crew twenty-four hours per day with 30-minute alerts during working hours and 60-minute alerts otherwise. The South Portland Coast Guard Base covers the coastal waters from Cape Cod, MA to the Canadian border. Because it has such a large area to cover, the Coast Guard will often call the SAR unit to assist in the area around Brunswick. There are no air ambulance services in this area of Maine and the forestry service has helicopters that are operated with minimal crew for fire spotting over the huge areas of forest land.

A notable medevac occurred this past year when a civilian employee at NAS Brunswick received burns over approximately 70% of his body. The SAR unit was called on by the local hospital to transport the patient to a trauma treatment center in Portland where initial treatment was

administered. Ground ambulance transfer was later used to transfer the patient to a larger medical facility.

b) Special

The helicopter crews support the East Coast SERE (Survival, Evasion, Resistance, and Escape) School in field training with CSAR (combat SAR) techniques using vectoring.

c) Collateral

The station Aviation Safety Officer and Transient Services Officer are among the SAR pilots. The previous Executive Officer was also a SAR pilot.

5. NAS Oceana, VA [Ref. 18]

a) SAR

This base is home to the Navy's east coast F-14 and E-2 squadrons. Over ninety percent of the SAR reports filed in the last two years have been military vice civilian. The SAR unit also responds to alerts from nearby NAS Norfolk and the civilian alerts received are generally boating related when the Coast Guard is too saturated to respond.

b) Special

The helicopter crews are occasionally tasked with channel SAR when aircraft carriers are entering or leaving port. They are also tasked with personnel transfers between local area military bases.

c) Collateral

Most of the collateral duties held by SAR pilots are in support of the unit, but two pilots hold the jobs of Flight Support Officer and Range Officer for the station.

6. NAS Patuxent River, MD [Ref. 19]

a) SAR

This station has a number of experimental aircraft as well as mission profiles that include extreme flight maneuvers. The tenant Test Directorates will notify the SAR unit through the air operations office when extreme test profiles are expected. During these special tests, the SAR alert is increased to a ready status where an aircraft can be airborne within 5 minutes, otherwise a 15-minute response time is maintained between 0800 and whenever the field goes to category " C" flight operations. This categorization is determined by the air operations office and essentially

means all local area flights and test flights are completed. Between this time and 2300 the SAR unit maintains a one hour alert, and after 2300 the SAR unit is secured. The airfield is normally closed on the weekends, but accommodates the special needs of its users if they require Saturday and/or Sunday flight operations.

This SAR unit is unique in that two pilots are contracted civilians that are fully qualified as SAR mission and aircraft commanders. Their scheduling is unique in that their crew rest periods are more restrictive than the Navy's guidlines and their contract is written such that their pay is based on them being at the air station. They are normally scheduled in twelve hour shifts and they will remain at the station in alert status during those hours. They participate in all the SAR unit training if they happen to be on duty at the time and provide unit training lectures on a monthly rotation with all the SAR pilots. These pilots cannot be tasked with the collateral duties that the navy pilots perform when they are not flying.

The majority of SAR alerts this unit receives are military with only an occasional call for assistance from

the Coast Guard or the Maryland State Police. Just over three years ago the SAR unit received a great deal of press coverage when they were alerted to a charter fishing boat that was sinking. The SAR unit was able to recover all the survivors and made multiple trips to the sight in order to recover all other bodies. The SAR swimmers spent over an hour in the winter temperature waters to effect the rescues.

b) Special

Special tasking for the helicopters is minimal.

c) Collateral

The station Hurricane Evacuation Officer and Assistant Administrative Officer are SAR pilots.

7. NAS Pensacola, FL [Ref. 20]

a) SAR

The SAR unit assigns crews to provide twenty four hour alert status for the station. With the Mobile Coast Guard Group approximately fifty miles to the west, the SAR capabilities of this unit along the local coast and those to the east are utilized quite often for boating accidents and civilian light aircraft accidents. This unit also provides

support for the flight training missions conducted out of NAS Whiting Field located nearby.

b) Special

This unit provides a great deal of support to local training schools. The rescue swimmer school requires water jump support once per month for approximately twenty to thirty students. Both the Navy and Air Force deep water survival training centers are located on the base and require support. The Navy center utilizes the helicopters for demonstration hoist evolutions every Tuesday and Thursday, while the Air Force training, which includes raft deployment and aircraft signaling and vectoring techniques is only once each week. In addition to the military support missions, the station Disaster Assessment Officer works closely with local officials who regularly request the SAR unit to conduct inland river sweeps to check for damage and personnel following hurricanes and flooding.

c) Collateral

The collateral duties are all in support of the SAR unit with one exception, the station Honor Guard Division Officer.

8. **NAS Key West, FL [Ref. 21]**

a) SAR

This air station gets training detachments from nearly every aviation community in the Navy. The SAR unit assigns crews to provide twenty four hour alert status for the station. The number of civilian SAR's have greatly outnumbered those of military personnel. The Coast Guard helicopters frequently conduct day operations out of the air station but depart in the evening for their home base.

b) Special

Special tasking for the helicopters is minimal.

c) Collateral

The collateral duties are all in support of the SAR unit.

9. **NAS Meridian, MS [Ref. 22]**

a) SAR

This station is one of the busiest in the Navy because over 140 aircraft are used for the intermediate and advanced jet flight training that is located there. The SAR unit provides a 30-minute alert status from 0700 until the

last aircraft is back on the deck, seven days per week. Located at Meridian Regional Airport are KC-135 and CH-47 Mississippi and Army National Guard units, respectively. The SAR unit provides SAR support for these units as well as for the flight training missions that are located at Columbus AFB approximately ninety miles to the north.

The contribution to the civilian community has been in the form of searches and medevacs. The local and state agencies in the area do not have air search capabilities and often rely on the SAR unit's assistance coordinated through the national SAR plan. In Jackson, MS the aeromedical service is Life Flight Jackson and when they have been unable to perform medevacs due to saturation or aircraft availability, the SAR unit has filled in.

b) Special

Even though most of the SAR pilots are dual qualified to fly the C-12 and do support its mission, the C-12 is scheduled to be moved to NAS Memphis, TN in the fall of this year. The special tasking for the helicopters is minimal, but may see an increase when the C-12 is gone.

c) Collateral

The SAR pilots have a number of duties supporting the station. The base Aviation Safety Officer, Flight Support Officer, Security Officer and Field Support Division Officer are all SAR pilots.

10. NAS Corpus Christi, TX [Ref. 23]

a) SAR

The SAR unit provides service to units located at its own station as well as Ingleside Naval Station and NAS Kingsville. At Corpus Christi, T-34 aircraft are flown by the primary flight training squadron, VT-27, and MH-53's are flown from Ingleside. In addition to these, U.S. Customs Service P-3's and the Army Depot Maintenance Organization helicopter maintenance check flights are supported by the SAR unit. NAS Kingsville, like Meridian, has intermediate and advanced jet flight training squadrons. Since the Coast Guard air assets for the coastal area are also located at Corpus Christi, there is SAR capability overlap for the local maritime area. Typically, the Coast Guard will respond to the civilian maritime alerts while the SAR unit responds to the military and inland alerts unless there are

obvious time issues or a request between units exists. The SAR unit has mainly performed only military SAR support.

b) Special

There is minimal special tasking for the helicopters.

c) Collateral

SAR pilots perform the functions of Base Security Officer, Administrative Officer and Assistant Operations Officer.

11. NAS Guantanamo Bay, Cuba [Ref. 24]

a) SAR

The SAR mission at this station was primarily used to support off-shore ranges that are no longer active and do not require SAR support. The station is also in the midst of a down-sizing plan that is affecting most of its operations.

b) Special

The SAR unit helicopters are used for three missions; flying the station perimeter to support photography of the fence lines, medical transfers between

local facilities and dropping water on field fires during fire season.

c) Collateral

SAR pilots hold the jobs of SAR/Ground Safety Officer, Air Terminal Officer and Schedules Officer.

C. PERSONNEL

This section discusses the personnel assigned to support the SAR units. The different categories for discussion will be Officers, Aircrewman, SAR Corpsman and Non-Flight Enlisted personnel.

1. Officers

The general characterization of the pilots assigned to air station SAR falls into two different categories. The first category are those pilots who have a desire to continue in their warfare specialty (helicopter community), but also want to fly during their shore duty billet. This is typically a second tour Lieutenant who by most community's standards could have done better by being an FRS (Fleet Replacement Squadron) instructor or an instructor in the VT's (primary/intermediate flight training) or HT's (advanced flight training for rotory wing aviation). Being

a SAR station pilot does not take these officers out of their "normal" career track, but it is generally not encouraged, hence, the "pack plus" (the top rated officers in operational tour) normally avoid these billets. Another part of this category are those officers who have followed a traditional career path, been promoted to Commander and are assigned as station Executive Officers or senior department head billets.

The second category are those pilots who are not interested in following the typical path for their community. This category includes officers who plan to leave the Navy and are mainly interested in accumulating flight hours and/or the dual engine ratings associated with flying the C-12 at an air station. This category of officers range from second tour to senior Lieutenant Commanders who are looking forward to retirement.

2. Aircrewman

Retention of aircrew in the navy is becoming more difficult. The aircrew detailer is the person responsible for issuing new assignments to aircrewmen. If the aircrew detailer does not have an available aircrew billet, he is

forced to give the assignment task over to the rate (professional designation that defines the type of work the member performs) detailer to make the next assignment. According to the current aircrew detailer for E-5 and below, there are not enough shore-duty billets for all the aircrewman rotating off sea-duty. This is one factor that has contributed to thirty to forty percent of the Navy's aircrew leaving the service. [Ref. 25]

There are two categories of training that a designated aircrewman receives. Category I is an introduction to an aircraft in which the crewman has never previously been qualified. Category II training is refresher training for previously qualified crewman who had a break in flight status (transferring from a non-flying billet). Therefore, any time an aircrewman is detailed by the rate detailer there will be additional training costs when the crewman returns to a flying status.

3. SAR Corpsman

The number of possible billets for SAR corpsman is also decreasing [Ref. 26]. These HM's (hospital corpsman) are also qualified aircrewman. This dual qualification is a

tremendous asset to a SAR unit. Trauma victims, for example, have a probability of survival that is much like a person in the water; the longer it takes to get help the faster the chance of survival decreases. This demonstrates that emergency first aid and treatment is time critical and for this reason the SAR corpsman are a vital part of the SAR crew. The air station SAR units are the single largest provider of billets and training for SAR corpsman.

4. Non-Flight Enlisted Personnel [Ref. 27]

The air stations are allotted a certain number of personnel in each rate required to operate the SAR unit on the station. Theoretically, the personnel billeted to support the SAR unit could be separated into a nearly autonomous unit. In reality, however, many of the support-type rates are combined into the base support system and provide a great deal more for the base than just supporting the SAR unit.

IV. CASE COMPARISONS

This chapter examines two helicopter outsourcing experiences the Navy has been involved in during recent years. Both lessons learned and current issues that are still under debate are reviewed for possible applications to the SAR outsourcing issue. The two cases are the Military Sealift Command's proposed outsource of the vertical replenishment mission and the U.S. Antarctic Program's transition to outsourced helicopter support.

A. MILITARY SEALIFT COMMAND PROPOSED OUTSOURCE OF VERTICAL REPLENISHMENT (VERTREP) MISSION

1. Background

Naval ships at sea have two primary means of replenishing stores, or what is referred to as underway replenishment. The first method is through conventional replenishment, CONREP, which requires the transferring and receiving ships to stay within approximately 250 feet of one another and to be connected by cable transfer rigging for an extended period of time. The alternative is called vertical replenishment, VERTREP, where helicopters utilize an external sling load method of transferring pallets of stores

between ships. Both of these are typically done in conjunction with fueling-at-sea evolutions when a number of ships will rendezvous to refuel at the same time. In these situations, the stores transferring ship may also be the tanker in which case CONREP and/or VERTREP might be conducted simultaneously with fueling. Because VERTREP is much less restrictive on ship maneuvering and positioning it is normally the preferred method.

Most of the Navy's replenishment sources at sea are now operated by the Military Sealift Command (MSC). By request of the Deputy Under Secretary of Defense (Advanced Technology) and the Navy, MSC began a three phase test in 1995 looking at the viability of a commercial helicopter operator on MSC ships. The funding for the test was initially provided by USD(AT) as an Advanced Concept Technology Demonstration (ACTD) [Ref. 28]. This testing represented one of the Navy's most ambitious outsource initiatives and " outside-the-box" approaches to logistics at sea that has occurred in many years [Ref. 29].

The first two test phases utilized the Kaman Aerospace commercially used K-Max helicopter and the third used H-1's

operated by Evergreen Helicopters, Inc. The first phase took approximately two months and tested the capabilities and compatibility of the K-Max while conducting both shore and sea-based VERTREP operations to and from naval ships. The second phase was designed to determine if the civilian crew and equipment could perform during an extended six-month deployment. The deployment began in early May 1996 on the island of Guam when two K-Max helicopters departed onboard USNS Niagara Falls in support of battle group operations in the Arabian Gulf. The last phase of testing was accomplished in the fall of 1997 when Evergreen Helicopters' H-1's completed a Mediterranean deployment onboard the USNS Saturn/Sirius. During these tests, the concept of outsourced VERTREP on MSC ships was validated and the after action reports supported the operational feasibility of contracted helo services.

The current status of the outsourcing decision is that the Pacific Fleet prefers not to outsource while the Atlantic Fleet has proposed a plan to outsource the function on a limited number of ships. This outcome has resulted from the complexity of the decision. A study conducted by

the Center for Naval Analysis (CNA) calculated some breakeven prices associated with the outsourcing [Ref. 30]. In addition, the costs of outsourcing were compared with the support costs of the planned CH-60 infrastructure as specified by the HMP in a thesis conducted by LCDR M. McLean at the Naval Postgraduate School [Ref. 31].

CNA's study made two significant assumptions. The first was that immediate savings from infrastructure and personnel cutbacks would result if outsourced helicopters assumed the MSC/VERTREP role. The second was that no value was given to the multiple mission capability maintained in the HC squadrons as demonstrated by the station and fleet support roles of the non-deployed assets. The first assumption, according to the U.S. General Accounting Office (GAO) can be questioned because there is typically a cost associated with infrastructure dismantling and personnel phase-out. As a result, only a fraction of the estimated infrastructure cost savings would actually be reclaimed through a cost avoidance scenario [Ref. 32].

With respect to the second assumption, it should be noted that the CNA study did not account for other missions

being performed. When calculating the cost savings associated with the closing of two HC squadrons and resulting consolidation of units, there was no accounting given to those missions that would no longer be performed. The full cost savings was attributable to the elimination of the VERTREP function even though other missions were performed by the HC squadrons during land based rotations. Specifically, the HC squadrons were also conducting SAR, special operations training support, and fleet support. The elimination of these squadrons directly affected the performance of these missions, and there is a cost associated with either continuing to meet these mission demands or with no longer meeting the demands. In other words, the HC squadrons really produced a joint product - a range of missions - and there is no clear way to allocate costs to each mission. However, it is inappropriate to allocate all of the costs to one of the missions being performed.

The multiple mission capability is also an outgrowth of the need to meet a wartime surge. These capabilities are difficult to match with outsourced services because of the

natural absence of economic efficiencies [Ref. 33]. The CNA study did point out the complexity of meeting surge demands and attempted to account for them in some of their calculations. They also made several suggestions as to how the wartime surge requirements might be met.

McLean looked at the long-term cost implications associated with labor rate escalation and the cost comparison of capabilities. It was determined that employment costs for certain Standard Industrial Classifications (SIC), which determine the civilian pay scale, may escalate faster in the commercial sector than the in-house rates. This would mean that over the period of a contract the employment costs of civilian contract personnel might escalate to the point that the initial personnel cost savings are reduced or depleted. This cost reversal phenomenon is little understood and even less analyzed when considering long-term costs and requires further analysis. A comparison of capabilities was also presented by McLean. He compared the capabilities of the H-46 and the CH-60 with those of the K-Max and identified a number of asymmetrical mission capabilities. Several of these stem from the K-

Max's inability to perform night VERTREP operations, carry passengers, carry substantial internal cargo and its relatively low wind operating envelopes.

2. Comparison/Application

The analyses mentioned above were not assumed to be exhaustive studies nor were they the only studies on the subject, but they illustrate the complexity of the full analysis that is needed before a decision is made. The same issues raised in the analysis of VERTREP can also be raised when considering whether or not to outsource SAR at air stations.

First, when estimating personnel cost savings, which are typically the most substantial in cost comparisons, one must consider the collateral duties of the officers currently performing the SAR mission. From data collected through conversations with personnel at each of the eleven SAR stations, forty-one percent of the SAR pilots at the air stations have collateral duties in direct support of the stations and/or fly the C-12's scheduled flight operations. Likewise, the SAR corpsman are integral to the stations'

medical facilities. As these station support roles will exist even if SAR is outsourced, it is not clear which SAR unit manning could be eliminated and considered as cost savings if SAR were outsourced. Second, the " special" missions, listed in Chapter III, that are performed in support of the stations must be considered. If these " Special" missions are required to be performed by Navy helicopters, and if outsourcing SAR affects their successful completion, this must be properly accounted for as a by-product of SAR outsourcing. Clearly these types of issues must be addressed prior to any outsourcing. This type of information would need to be used to formulate the Performance Work Statement (PWS), which defines the scope of services desired from the contract and is also the basis for cost comparisons.

In McLean's analysis of employment costs for the aircraft industry (based on aircraft related SIC's), it was determined that private sector costs have risen faster over the last twenty years than those of the in-house or public employment costs. This establishes the need for analysis of the long-term cost savings as apposed to only short-term

projections. Finally, the capabilities of the proposed contractor would have to be compared with those currently being provided. Typically, the capabilities and expertise available within the private sector might be sufficient for most air station SAR requirements. Certain Federal Aviation Regulations, however, which apply to the contractor, would inhibit his ability to match the current level of performance. Specifically, when a commercial helicopter is either hoisting or lifting a person on a static line (short-haul), the helicopter must be able to maintain a hover with one engine inoperative [Ref. 34]. Meeting this requirement is not possible for most commercial helicopters at the operating altitudes of the three west coast stations where they are regularly tasked with rescues above 6000 ft.

B. U.S. ANTARCTIC PROGRAM OUTSOURCE OF HELICOPTER SUPPORT

1. Background

Since 1956 the Navy has provided helicopter support to the U.S. Antarctic Program. The Antarctic Program is sponsored by the National Science Foundation (NSF) and also supports science efforts of the National Aeronautics and Space Administration (NASA), U.S. Geological Survey (USGS)

and the National Oceanic and Atmospheric Administration (NOAA). The Navy helicopter support ended with the close of the 1995-1996 austral summer season. For the past two seasons, Petroleum Helicopters Inc. (PHI) of Lafayette, Louisiana has been the contracted supplier of helicopter services and hopes to complete all three of the remaining one-year options on their contract. The transition began in 1993 when the Navy, under the pressure of down-sizing and its need to reclaim personnel, stated its desire to withdraw from supporting the Antarctic Program [Ref. 35]. This began a progressive process in which the Navy divested itself of its many support functions as well as the helicopter support.

Having considered the option of using contracted helo services many times, the NSF Office of Polar Programs was somewhat apprehensive about the transition for the same reasons it had chosen not to outsource previously. Some of these concerns were the inexperience of contracted helo pilots in the Antarctic conditions, safety of operations, and less flexibility of operations. All of the factors

translate into potentially higher cost per level of service [Ref. 36].

During the past two seasons, however, the Antarctic program has been pleased with the results of the transition. Lacking equivalent cost data, the direct cost comparison between the Navy helicopter support and the contracted support is difficult, but estimates show that the costs to the Program have been cut in half from $5 to $2.5 Million [Ref. 37]. It must be understood, however, that this savings does not reflect the conscious trade-offs between capability and cost that were made in the outsourcing process. One of the more significant trade-off decisions was the use of fewer airframes to reduce cost. Instead of trying to match the six H-1's that the Navy had used, the contract specified that only four aircraft would be used. Three of these are AS350B2 Squirrels and the fourth is a Bell 212 (civilian equivalent to H-1). The AS350's only carry half of the passengers and sixty percent of the maximum cargo load of the Navy H-1's. This decision has increased the flight time required for some of the larger science parties since they now require either multiple

helicopters or trips to affect the same moves. Part of the motivation behind the decision to structure helicopter capability in this manner is that the AS350 is forty percent cheaper to operate than the Bell 212.

A number of issues that resulted from the contracted service had to be resolved, the first of which was passenger safety. In the past, the Navy aircrewman conducted a thorough safety brief and directed and assisted the science party members in loading and unloading the helicopters. In the absence of the crewman (contract helicopters are single-piloted with no crew), support personnel had to be hired to conduct initial four hour training classes on helicopter safety. These personnel belong to the general services support contractor for the program and represent additional costs to the helicopter contract service. For the frequent helicopter users more lengthy courses are required. The result is an increased commitment of time and effort required of a science party which may detract from their research efforts. Another issue that was unanticipated by the Antarctic Program planners was the decision by the contractor to leave the helicopters in Antarctica for the

term of the contract. This decision gained the program benefits in the form of air and sea-lift, but it doubled the aircraft costs. The Antarctic Program is essentially paying for full usage of the helicopters because the aircraft are not available to the contractor for other work during the austral winter season.

The estimated cost savings from $5 to $2.5 Million is not as great as it may seem considering the cost of additional support personnel, possible distractions and increased burden placed on the researchers, and the reduced airframes that are available. In order to more fully estimate the associated costs these considerations must be evaluated and compared to the benefits received.

2. Comparison / Application

Successful outsourcing can be achieved, but the meaning of success must be carefully defined. Unless there are equivalent services, there will always be trade-offs that must be made. As in the case of Antarctic support, a determination of the minimum level of service must be made and the subsequent trade-offs recognized. The trade-offs

between capability and cost in this case were not critical and could be dealt with. However, it is important to understand the point at which trade-offs become more difficult because of mission requirements. At some point, one may no longer be willing to sacrifice capability to reduce cost.

With respect to the SAR mission, loss of life is possible if a proper level of service is not determined and provided. Any trade-offs then, sacrificing capability for cost reduction, that would inhibit or somehow diminish the life-saving capability of the SAR unit could be considered critical. One such capability would be the speed at which emergency medical care is delivered to a trauma victim. In many remote parts of the station operating areas whether land or sea, the ability to treat these trauma victims in the most expeditious manner requires the use of a hoist or the combination of rappelling and short-haul techniques. Account must be given to the extremely high insurance rates that are imposed on helicopter contractors when engaged in external personnel lifting [Ref. 38].

Consideration must also be given to the amount of readiness that would be required of a SAR contractor. Military SAR support at air stations is relatively infrequent but it is unscheduled and the speed of response is governed by alert times that may vary depending upon the station's operations. Just as the Antarctic Program pays for the winterized helicopters due to their non-availability, the Navy would have to purchase readiness and availability that would preclude the contractor from utilizing certain assets for other profit ventures. The capacity to provide a ready SAR platform would not be much different for a civilian contractor than it is for the Navy SAR unit. The SAR unit, though, can provide other services (" special tasking") for the station and can also support the National SAR Plan when it does not interfere with military missions. A contracted SAR provider would require contractual agreements to support additional tasking. In the light of the National SAR Plan, the additional payment for services have to be analyzed to determine public-private competition policy.

V. ANALYTICAL STUDY

A. QUALITATIVE MEASURE OF BENEFIT

Three types of analysis are conducted in this chapter. First, the relative importance of benefits provided by the SAR units at Naval Air Stations is measured. In this analysis a decision support system (DSS) generator is utilized to evaluate subjective data gathered in a sample questionnaire from air station SAR personnel and the Navy's west coast SAR evaluators. Second, the relative time spent on the different tasks assigned to the SAR personnel at air stations is summarized. Time estimates and job tasking information was obtained from the personnel at NAS Lemoore and NAS Fallon. Third, a comparison of annual SAR evaluation exam scores between SAR units and operational squadrons is provided.

1. Decision Support System

Decision Support Systems (DSS) are software tools that facilitate the application of analytical and scientific methods to decision making. The models and solution algorithms used in DSS draw largely from research in information systems, operations research and management

science. The process of formulating these models has always placed significant emphasis on user-involvement. The evolution of DSS from large main-frame computers to the desktop computers was made possible through the introduction of DSS generators. The basic concepts of DSS generators were introduced by R. Sprague in 1980 [Ref. 39]. DSS generators are software products that enable development of application specific DSS. Applications range from interactive financial planning systems to instructional tools in academic courses to establishing production level DSS to support decision making in organizations.

There are a number of these software products in the market today and different approaches to solving decision problems are used. The two main approaches utilized within these different software products are uncertainty analysis and multi-criteria analysis. Decision trees, influence diagrams, or some proprietary variants of these are used in problem solving software packages that support decision making under uncertainty. Multi-criteria decision packages are further broken into two categories; those that use traditional methods such as Multi-Attribute Utility Theory

and Analytical Hierarchy Process (AHP), and those that use non-standard multi-criteria algorithms.

The DSS generator used in this study is EC PRO™ for Windows, developed by EXPERT CHOICE™, which is based on AHP methodology for decision analysis. AHP is a method that produces a ranking of decision alternatives with a well defined hierarchical structure.

In order to utilize AHP methods, the user must formulate mutually exclusive and collectively exhaustive criteria that support a goal. Each criteria can also be broken into sub-criteria which can be further subdivided until each of the lowest level criteria are related to the decision alternatives. Whereas traditional decision analysis utilized human judgment based on intuition and experience, use of AHP in a DSS generator allows for these same judgment processes to be used in a more systematic manner. The difference, however, is that by subdividing the problem down to basic criteria there is less likelihood that individual bias may affect the final outcome. [Ref. 40]

2. EXPERT CHOICE™ Model

The model used in this study was developed as an experimental approach to quantify the subjective value of benefits received by the Navy through the existence and functions of the SAR units at Naval Air Stations. In order to generate input from those involved with the SAR mission a sample questionnaire was developed that enabled pairwise comparisons to be made between various levels of criteria as they related to the next higher level criteria as well as to the alternatives under consideration. In this preliminary work, the sample questionnaire and its administration were not governed by scientific or statistic protocol that would be necessary if this approach were to be used in an actual decision analysis. Rather, they were formed and administered as an illustration of how an AHP DSS generator could be utilized to quantify the decision of whether or not to outsource the SAR mission.

At the top level (level 0) of the model, the goal was chosen as " Gross Benefit" to the U.S. Navy. In correlation with the objectives of this thesis, the direct dollar costs associated with either current operations

(i.e., operations and maintenance, aircraft procurement and military personnel) or prospective outsourced operations were not considered. Hence, the goal of the decision analysis is to assess those factors other than direct dollar costs that contribute to the benefits obtained by the Navy from performing the SAR mission at air stations.

There were four criteria chosen as mutually exclusive, collectively exhaustive components of the goal, " Gross Benefit" (refer to figure 2). These criteria (level 1) are the benefits derived from " Experience," " Rotation,"

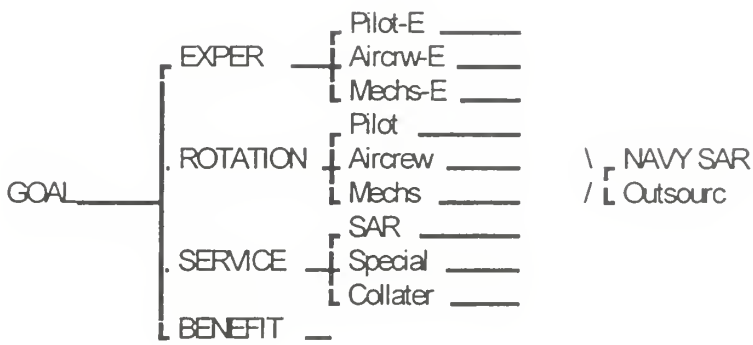


Figure 2 - AHP Model Format

" Service" (provided to the air station), and " Benefit" (benefits to the Navy such as public relations). The definitions of these terms is contained in the sample questionnaire located in Appendix B of this thesis. The next sub-criteria (level 2) associated with the level 1 " Experience" and " Rotation" criteria are the benefits to the Navy associated with the pilots, aircrewman and non-flight enlisted personnel. With respect to level 1 " Service" , the sub-criteria (level 2) were the benefits gained by the Navy directly from the " SAR" mission, from " Special" tasking and from " Collateral" duties. The " Benefit" category did not have any sub-criteria. Level 3 contained the alternatives which are: (1) Retain land-based Navy SAR mission as currently performed, and (2) Outsource the SAR mission to a private contractor. For the purpose of the sample questionnaire, it was clearly communicated to the respondents that only the SAR mission would be outsourced and the special missions and collateral duties would continue to be handled by the Navy through available means. Respondents also understood that no account was to be given in the responses to their own estimates of differences in

direct unit costs. Only the benefit side of the outsourcing issue was being addressed.

3. Model Application & Results

The sample questionnaire was given to eight officers and enlisted personnel at both the Chief of Naval Operations SAR Model Manager's office and the Commander Naval Air Force Pacific Fleet SAR Evaluator's office. Additionally, the questionnaire was completed by seven officers and enlisted personnel from NAS Lemoore and NAS Fallon. Expert Choice's fundamental scale for comparisons between criteria ranges from one, where the specified criteria are equal, to nine, where one criteria is extremely more important than the other. The sample questionnaire utilized a form of pairwise evaluation by asking the respondents to rank order each set of sub-criteria with respect to the next higher criteria.

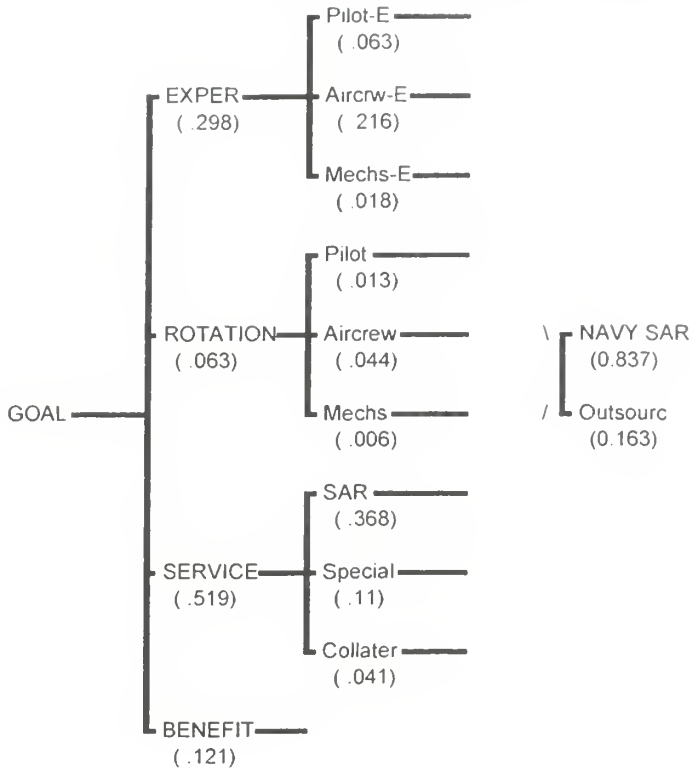
First, in relation to the goal of obtaining "Gross Benefits" to the Navy, they were asked to rank the relative importance of the four criteria; "Experience," "Rotation," "Service" and "Benefit". Next, they were asked to rank the relative benefits to pilots, aircrew and mechanics (non-flight enlisted personnel) with respect to

" Experience" and " Rotation." They were then asked to rank the relative benefits received from " SAR," " Special" and " Collateral" with respect to " Service." The final judgment in the questionnaire was to determine whether the relative benefits received from the pilots, aircrew, mechanics, SAR, Special and Collateral would become worse or better if the SAR mission were outsourced. For this question the fundamental scale was used to indicate the relative importance of the sub-criteria (level 3) which could vary from no change to extreme change.

The data received from the two groups was given equal weighting which allowed the groups' averages to be used as inputs to the model. A separate criteria level is created for the group of SAR evaluators at level 1 in order to examine whether there is consistency across the responses. The results are reported in Appendix C.

Three data sets were entered into the model: the group of evaluators, the SAR station personnel and the total group. The results from the two groups were very similar as shown in figures 3 and 4. The output from the total group

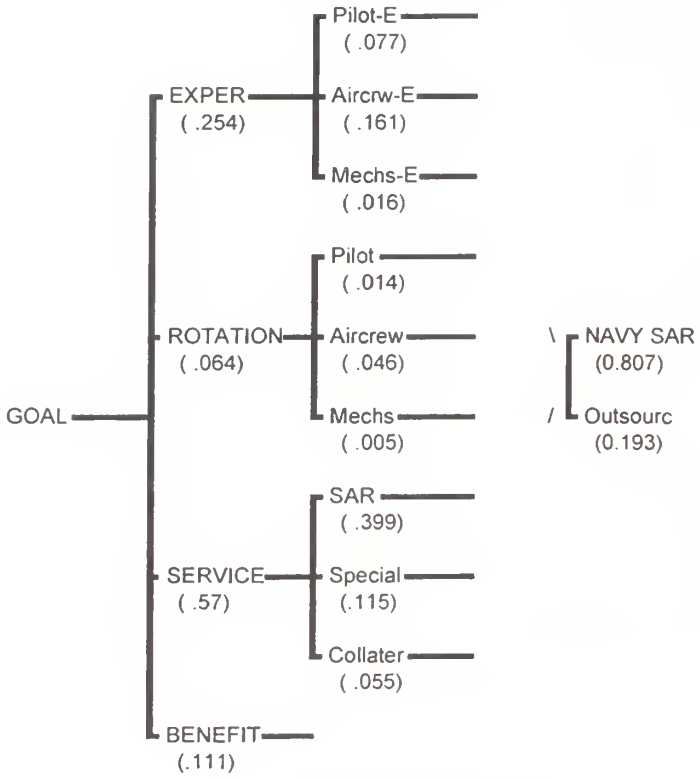
MEASURE OF "GROSS BENEFIT" TO THE U.S. NAVY
GROUP 1



Abbreviation	Definition
GOAL	
Aircrew	Shore-duty flying billets/Career enhancement
Aircrw-E	Flying skills & proficiency/SAR knowledge/translation to fleet
BENEFIT	The "real time" benefits received by the Navy (overt and covert)
Collater	Collateral duties and assignments accomplished by SAR personnel
EXPER	Experience base from which the Navy can later draw or benefit
Mechs	Shore-duty rate experience/advancement improvements
Mechs-E	Hands-on rate experience/advancement benefit/translation to fleet
NAVY SAR	Provide SAR at NAS's with organic navy units (unchanged)
Outsourc	Outsource the SAR mission at NAS's
Pilot	Shore-duty flying billets/Career path enhancement
Pilot-E	SAR knowledge/Pilot skills & proficiency/translation to fleet
ROTATION	Rotation Base provides smooth career flow thru sea/shore rotation
SAR	Level of SAR support and service provided to the NAS
SERVICE	The level of Service provided to the NAS
Special	The special mission support and service provided to the NAS

Figure 3 -- EC PRO™ (AHP) Output for Group 1

MEASURE OF "GROSS BENEFIT" TO THE U.S. NAVY
GROUP 2



Abbreviation	Definition
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SERVICE	The level of Service provided to the NAS
Special	The special mission support and service provided to the NAS

Figure 4 -- EC PRO™ (AHP) Output for Group 2

is not shown in this thesis because it was consistent with that of the two individual groups and added no further insight for analysis. The inconsistency ratio which is given in the synthesis output is an accumulation of inconsistency measurements made for each judgment in the model. The synthesis output for the two groups is presented in Appendix D. Typically, an inconsistency ratio of 0.10 or less is acceptable. Comparison of the results in Appendix C, where each respondent's judgments were entered individually, and those in Appendix D, where the values of judgments were averaged and then entered, show that inconsistency is compounded by using average values. The inconsistency ratio of 0.01 in Appendix C is an order of magnitude better than the ratio value of 0.11 in Appendix D which uses the averaged inputs.

Both groups agreed that the benefits provided to the air stations categorized as " Service" are very important. This can be seen in the model outputs as 0.519 and 0.570 for groups one and two, respectively. These numbers can be interpreted as percentages of the total " Gross Benefit" , just over fifty percent of the benefit to the Navy at this

level is attributed to " Service" . These relatively large percentages are not surprising because it is under this category that the actual work of the SAR providers is performed with the corresponding visible benefits. The second most important criteria with respect to the goal was " Experience" with just over twenty five percent of the overall goal being obtained by this criteria. The importance of these two criteria is followed by the importance assigned to " Benefit" and " Rotation" .

These results are significant in two respects: first, the relative independence of the sample groups brought remarkably similar results, and second, the total value given to the " intangible" benefits derived from " Experience" , " Rotation" and " Benefit" represents approximately forty-five percent of the total benefit. At the next level, the measures of benefit toward aircrewman are nearly three times those of the pilots and ten times the benefit of the mechanics.

There are several improvements that would need to be made in order to use the DSS generator and AHP methodology in a decision analysis of SAR mission outsourcing. First,

one would need to begin with a more careful determination of how encompassing a goal should be for the analysis. This illustration of AHP only examines the benefits associated with the non-direct cost items. However, EC PRO™ For Windows has the capabilities of including quantitative measures such as direct dollar costs as well as other qualitative judgments. As described in this illustration, a measure of "Gross Benefits" can be developed in one model. A separate model could be used to address the various categories of direct unit costs and the two models could be combined into a single model that assesses "Net Benefits." Alternatively, the benefit and cost side could be analyzed separately.

Once the level of modeling is determined, which also includes the goal, the criteria must be determined. As mentioned earlier, these must be both mutually exclusive and collectively exhaustive. No overlap of meaning is permitted to exist between each of the criteria and they must cover the entire range of criteria supporting the goal.

B. AIR STATION TASK ANALYSIS

The relative amount of time spent on the different tasks assigned to the SAR personnel at NAS Lemoore and NAS Fallon is summarized in this section. The information gathered for this section was obtained through a combination of interviews and questionnaires. Figure 5 shows the results of data collected.

FALLON	" SAR"	" COLLATERAL "	" SPECIAL "
Pilots	14%	85%	1%
-flight time	85%		15%
Aircrew	100%		
Non-Flight Enlisted	N/A (helo maintenance is contract)		
SAR Corpsman	23%	77%	
LEMOORE			
Pilots	53%	46%	1%
-flight time	40%	50%	10%
Aircrew	100%		
Non-Flight Enlisted	98%	2%	
SAR Corpsman	19%	81%	

Figure 5 - Job Summary Table for personnel at NAS Lemoore and Fallon. Categories are defined in Appendix B. (percentages were rounded)

As shown in figure 5, the SAR corpsman are heavily involved with their collateral duties at the station medical

facilities. In many situations these duties might even be considered to be their primary responsibilities. The collateral duties assigned to SAR pilots also require a significant portion of their time. The difference between Fallon and Lemoore is that all of the Lemoore pilots are dual qualified to fly the C-12 fixed-wing aircraft as well as the helicopters. The pilots at Lemoore are tasked with running the operations and scheduling of both the C-12's and the SAR helicopters. Half of the Fallon pilots have collateral duties in support of the station, and the significant amount of time that the Executive Officer spends in his job has weighted the overall percentage toward " Collateral" .

These results also seem to support the importance of the SAR mission to the aircrewman that was reported earlier in this chapter as part of the AHP results. Aircrewman devote nearly one hundred percent of their time to the SAR mission. For those at Lemoore, time is also spent doing the daily maintenance tasks on the helicopters because each crewman is also a mechanic.

C. EXAM SCORE COMPARISONS

The final comparison made in this chapter is between the annual SAR evaluation exam scores of the west coast station SAR units and a sample of operational squadrons taken between 1992 and 1997. This comparison is important because higher scores at the station SAR would demonstrate a benefit to the fleet. They could improve fleet performance by sharing their experiences and knowledge when they returned to sea-duty. Figure 6 is a compilation of the test score data. The three west coast SAR stations, Whidbey Island, Fallon and Lemoore were compared against two HC, three HS and two HSL squadrons also from the west coast.

Even though there is a slightly higher mean for the SAR station pilots, it may not be significant enough to support the hypothesis. These scores do show a fairly equivalent knowledge base between the sea-duty operational squadrons and the shore-duty station SAR unit. Considering the pilot scores are from units where approximately half of the pilots either retire or separate from the service, the scores show a level of motivation and knowledge equal to that of the operational squadrons [Ref. 41].

YR	NAS FALLON	NAS LEMORE	WHIDBEY ISLAND	
1997	3.93	3.93		
1996	3.86	3.66	3.86	**PILOT EXAMS**
1995	3.78	3.7	3.81	
1994	3.82	3.93		
1993	3.93	3.92	3.99	
1992	3.85		3.75	
average	3.86	3.82	3.85	3.85

YR	HC-5	HC-11	HS-8	HS-4	HS-2	HSL-45	HSL-43
1998							
1997	3.89	3.91	3.96	3.94	3.89	3.95	3.89
1996	3.82	3.71	3.95	3.93	3.86	3.87	
1995	3.82		3.7	3.73	3.85	3.87	3.78
1994	3.83	3.88	3.88		3.71	3.94	3.87
1993	3.88	3.91	3.7	3.7	3.95	3.9	3.75
1992		3.62	3.7	3.94	3.8	3.75	
average	3.84	3.80	3.81	3.84	3.84	3.88	3.82
							3.84

YR	NAS FALLON	NAS LEMORE	WHIDBEY ISLAND	
1997	4	3.57		
1996	3.7	3.675	3.8	**AIRCREW EXAMS**
1995		3.85	3.82	
1994	3.98	3.96		
1993	3.94	3.8	3.93	
1992	3.69		3.91	
average	3.86	3.77	3.86	3.83

YR	HC-5	HC-11	HS-8	HS-4	HS-2	HSL-45	HSL-43
1997	3.81	3.85	4	3.83	3.93	4	3.93
1996	3.86	3.84	3.94	3.95	3.7	3.75	
1995	3.94		3.85	3.82	3.9	3.9	3.83
1994	3.68	3.83	3.96		3.81	3.91	3.97
1993	3.81	3.93	3.85	3.94	4	3.9	3.92
1992		3.89	3.74	3.88	3.61	3.84	3.96
average	3.82	3.86	3.89	3.88	3.82	3.88	3.92
							3.87

Figure 6 - Annual SAR Evaluation Exam Score Data.

In the last two years the aircrewman have been given separate exams, one for maritime SAR and the other for inland SAR, instead of the single combined exam from previous years. These test scores were combined into a single average score to enable tabulation and comparison in the figure above. Data gathered from NAS Fallon and NAS Lemoore shows that a majority of the aircrewman who are at station SAR units stay in the Navy and return to sea-duty. The exam scores of the aircrewman suggest that these aircrewman are as motivated as their sea-duty counterparts.

VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. SUMMARY

Should the U.S Navy outsource the SAR mission at Naval Air Stations? This thesis has concentrated solely on the benefits received by the Navy from performing the SAR mission in house. By exclusively focusing on the analysis of benefits, it is not possible to decide whether outsourcing should take place. Similarly, outsourcing decisions should not be made solely on the basis of analysis that only consider direct costs. The question that has been posed can only be answered by considering both the benefits and costs of outsourcing SAR.

To address this issue, it is important to determine whether the SAR mission is a Core function, that is, an inherently governmental function. While these two functions appear to come from different roots, they are essentially the same when outsourcing is being considered. This is because they yield essentially the same result. The determination of whether a function is either Core or inherently governmental is the responsibility of the Secretary of Defense and the services.

The SAR mission has not been clearly defined as an inherently governmental function, and analysis shows that SAR services can be purchased as a commercial activity. Since commercial activities are governed under the policies of OMB A-76, the outsourcing determination would be accomplished under A-76 competitive procedures. If preliminary studies were to show that a certain dollar savings could be gained through a competitive process, this is not sufficient to conclude that " best value" would be also be achieved. By focusing on the determination of " Gross Benefits" to the Navy, this thesis contributes to the calculation of best value. However, a full study of SAR outsourcing requires careful analysis of both the benefit and the cost side.

Savings from outsourcing may only occur when there are private sector producers who can perform the outsourced function. If it is not determined that SAR is an inherently governmental function, then by default it would be considered a " commercial activity." However, as shown in Chapter III, local competition with Navy SAR does not yet exist at any of the eleven air stations, at least in the

sense that local competition is not able to achieve the capabilities required to perform the mission in the current market climate. In the near term, therefore, this suggests that little savings would be gained by outsourcing. It should also be noted that OMB A-76 specifies that when no satisfactory commercial source is available to provide the service, as is the case for the high altitude hoisting operations required in certain SAR operating areas, government performance of a commercial activity is authorized.

Although this thesis has analyzed the importance of the experience and rotation base for both officers and aircrew members, the latter service members need to be given particular consideration in SAR station evaluations. Further analysis is required to determine the extent to which the rotation base of aircrew members is dependent upon shore duty billets such as the SAR stations. There are indications, however, that shrinking retention rates for aircrewmen are directly associated with fewer shore duty flying billets. This may support the view that shore-duty SAR is a Core function. Readiness and sustainibility may be

impacted if these retention rates are negatively impacted by the elimination of Navy shore-duty SAR

B. CONCLUSIONS/RECOMMENDATIONS

The Analytical Hierarchy Process has been introduced as a viable methodology for determining relative values of both direct and indirect benefits. Since the direct benefits of mission accomplishment are much easier to understand and evaluate, they serve as a relative gauge for the more "difficult to measure" indirect benefits. Together, direct and indirect benefits enhance one's understanding of the results that may occur from decisions concerning outsourcing.

Recommendation: Conduct further research into the application of Analytical Hierarchy Process and other Decision Support System methods for determining the values of benefits received by the Navy.

The determination of whether a function is Core, "inherently governmental" or commercial is essential when comparing the possible outsourcing strategies for that function. Personnel strength requirements further

complicate outsourcing strategies when retention rates are affected.

Recommendation: Determine Core Rotation Base needs for the search and rescue mission using appropriate methodologies.

Recommendation: Conduct research to determine the extent to which the rentention of aircrew members is dependent upon shore duty billets such as the SAR stations.

APPENDIX A. DEFINITION OF TERMS

Outsourcing is the operation of a commercial activity for the Government by a contractor. Essentially, it is characterized by the award of a contract for a specific period of time (typically one year) with two or more renewal option periods. The Government retains ownership and control over operations in the activity through surveillance of the contractor. The primary method for outsourcing commercial activities is through competition between the Government and private sector (i.e., under the A-76 program, comparing the cost of in-house to contract performance to determine the most efficient and cost-effective mode of operation). [Ref. 42]

Privatization differs from outsourcing in that the Government divests itself of a commercial activity and purchases goods and/or services from commercial sources. The Government may specify quality, quantity, and timeliness requirements for purchased goods and services; however, it has no control over the operations of the activity. The same activity may also provide these goods and services to other customers. [Ref. 43]

A-76 Program - Authorized by OMB Circular A-76, the Commercial Activities Program (commonly referred to as the "A-76 Program") is a valuable resource management tool that allows commanders to compare the relative cost of performing commercial activity type work using Government employees versus contract services. With continued pressure to reduce infrastructure costs, commanders increasingly use this program to determine how to best apply limited resources. The Commercial Activities Program has an impressive track record for reducing operating costs. Installation Manpower and Quality Offices are responsible for administering this program and should assist commanders in exploring the potential cost savings it can produce. [Ref. 44]

Commercial Activity is an activity that provides services obtainable from the private sector. Examples of commercial activities include custodial services, grounds maintenance, base supply, vehicle operations and maintenance, etc. A commercial activity may be performed by military and/or Federal civilian employees, or contract personnel. [Ref. 45]

Inherently Governmental Functions - These are functions so intimately related to the public interest they mandate performance by the Government. For example, command & control, intelligence operations, foreign relations, directing Federal employees, and accountable officers with discretionary authority to disburse funds are inherently governmental functions. These type functions are not in competition with the private sector [Ref. 46]. These functions include those activities that require either the exercise of discretion in applying Government authority or the making of value judgments in making decisions for the Government [Ref. 47].

Best value is the expected outcome of any acquisition that ensures the customer's needs are met in the most effective, economical, and timely manner. It is the result of the combination of: the unique circumstances of each acquisition; the acquisition strategy; choice of contracting method; and the award decision. Negotiated acquisition techniques used to obtain best value may span a "continuum" from low priced technically acceptable to tradeoffs between price, past performance and the technical solution. [Ref. 48]

Most Efficient Organization (MEO) - The MEO refers to the Government's streamlined in-house organization to compete with contractors to perform a commercial activity. It may include a mix of Federal employees and contract support. It is the basis for all in-house costs entered on the Cost Comparison Form. The MEO is the product of the Management Study and is based upon the PWS. [Ref. 49]

Performance Work Statement (PWS) - A performance work statement is a statement of the technical, functional and performance characteristics of the work to be performed, identifies essential functions to be performed, determines performance factors, including the location of the work, the units of work, the quantity of work units, and the quality and timeliness of the work units. It serves as the scope of work and is the basis for all cost entered in the Cost Comparison Form. [Ref. 50]

APPENDIX B. SAMPLE QUESTIONNAIRE FOR THE EVALUATION OF "GROSS BENEFIT" FROM STATION SAR

RATE/RANK_____ JOB TITLE_____

The following survey is purely subjective in nature and refers to those pilots, aircrewman and non-flight status enlisted that are assigned to support the SAR Mission at Naval Air Stations. Please answer the questions based upon your experiences, expert knowledge and personal opinion. The following definitions should be considered when answering the questions:

EXPERIENCE - The experience, or expertise which is gained by an individual as a result of being assigned to an air station to support or perform the SAR mission, and which will benefit the navy in that individual's future assignments or toward advancement. (i.e. flight time, rate experience, SAR training, etc.)

ROTATION - The benefit received by the service member because there was a shore-duty helicopter billet available to fill (i.e. retention, morale), and the relative importance and support of the Navy's sea/shore rotation policy.

SERVICE - The benefits to the Naval Air Station and its tenant commands derived from services performed by the SAR providers. This should include the SAR support, range support, special mission assignments, collateral duties and responsibilities that are performed.

SAR - The training and operations associated with SAR at the air station

SPECIAL - All the tasks performed with the helicopters that are not in direct support of SAR.

COLLATERAL - All the duties and responsibilities associated with assigned collateral duties (not in direct support of SAR) including C-12 flight schedule support.

BENEFIT - The benefit that the Navy receives from the personnel assigned in support of the SAR mission. This should include things such good public relations when Navy SAR assets perform civilian rescues or community services.

1.) Rank the four concepts as to which should be the most important concern to the Navy and which the least. 1 is most important down to 4 as the least. If you think one or more should have equal importance use the same number for each.

EXPERIENCE _____

ROTATION _____

SERVICE _____

BENEFIT _____

2.) With respect to **"Experience"** and **"Rotation"** rank the following: (1 producing the greatest benefit to the Navy and 3 the least. If they are equal use the same number.)

	Experience	**Rotation**
PILOT	_____	_____
AIRCREW	_____	_____
MECH's	_____	_____

3.) With respect to **"Service"** rank the following: (1 producing the greatest benefit to the Navy and 3 the least. If they are equal use the same number.)

SAR _____

SPECIAL _____

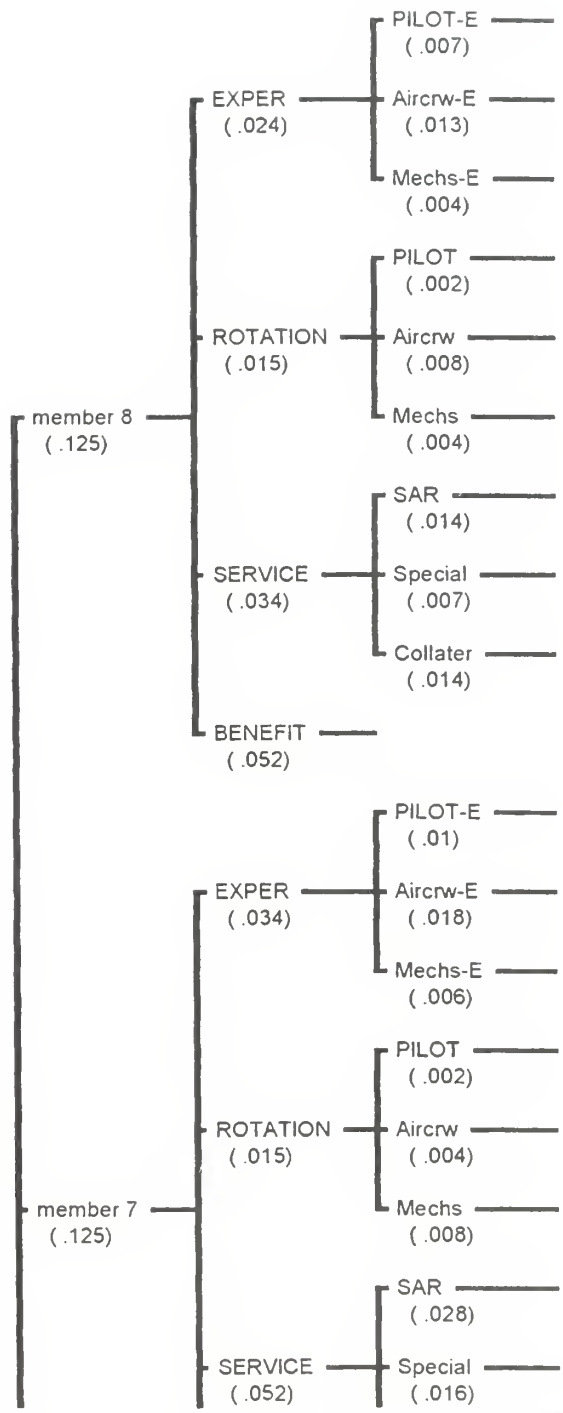
COLLATERAL _____

4.) If the SAR Mission at naval air stations were outsourced, would the following remain the same, be moderately changed, greatly changed, very greatly changed or extremely changed. Indicate on the given scale for each category with an **X**.

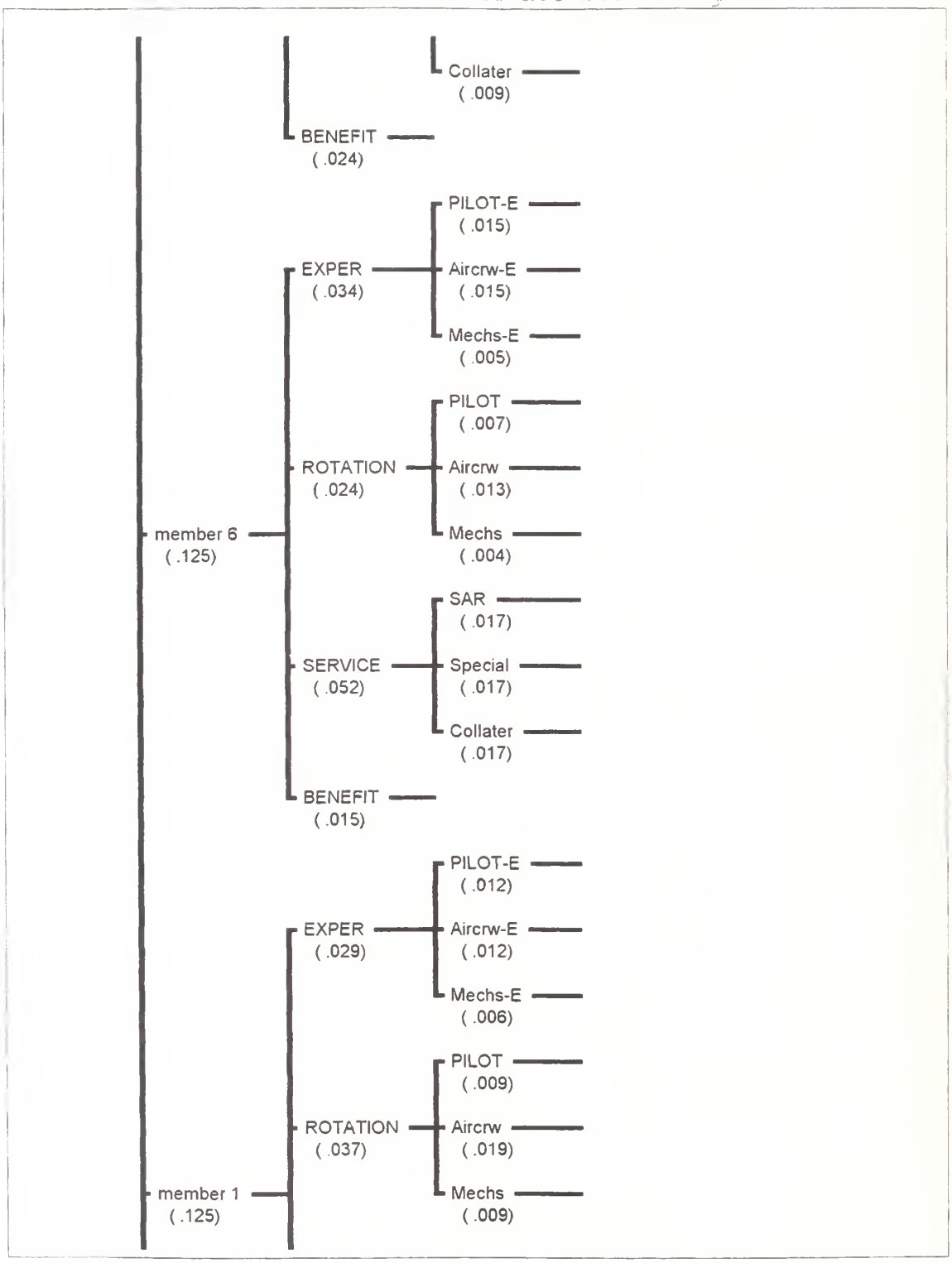
	WORSE							**BETTER**	
	Extreme	Very Great	Greatly	Moderate	Same	Moderate	Greatly	Very Great	Extreme
PILOT									
AIRCREW									
MECH's									
SAR									
SPECIAL									
COLLAT'L									

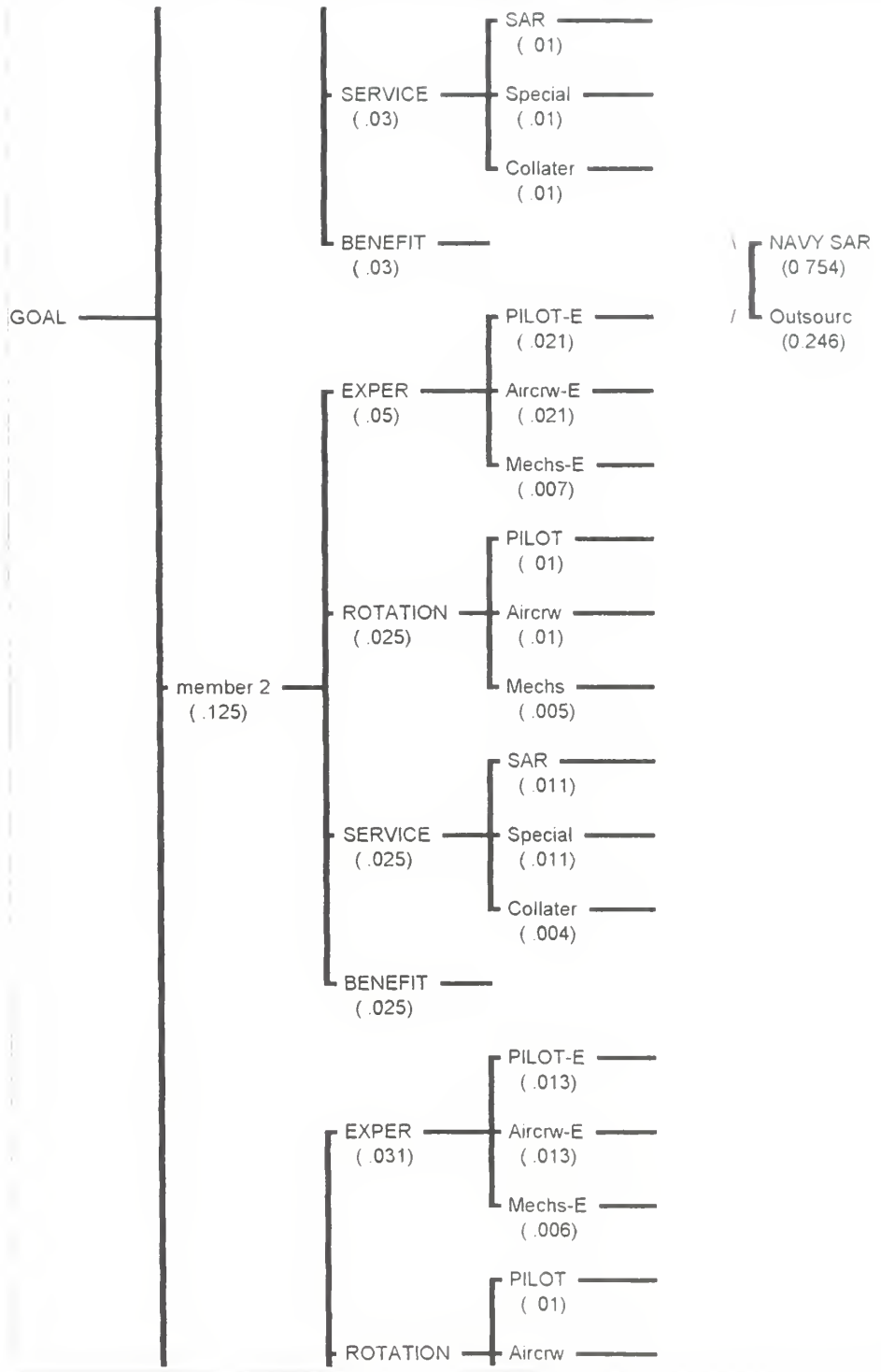
APPENDIX C. ECPRO™ (AHP) OUTPUT-GROUP 1 (INDIVIDUAL INPUTS)

"Gross Benefit" to the U.S. Navy



"Gross Benefit" to the U.S. Navy




GOAL
member 2
(.125)
SERVICE
(.03)
SAR
(.01)
Special
(.01)
Collater
(.01)
BENEFIT
(.03)
NAVY SAR
(0.754)
Outsourc
(0.246)
EXPER
(.05)
PILOT-E
(.021)
Aircrw-E
(.021)
Mechs-E
(.007)
ROTATION
(.025)
PILOT
(.01)
Aircrw
(.01)
Mechs
(.005)
SERVICE
(.025)
SAR
(.011)
Special
(.011)
Collater
(.004)
BENEFIT
(.025)
EXPER
(.031)
PILOT-E
(.013)
Aircrw-E
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Mechs-E
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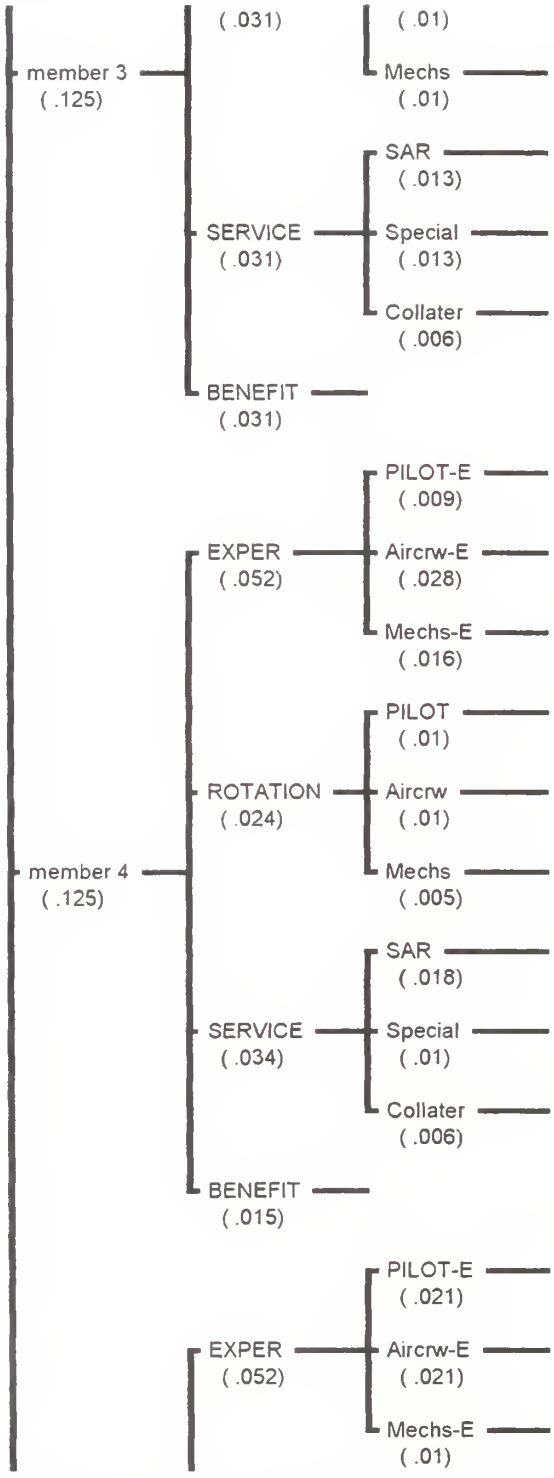
ROTATION
PILOT
(.01)
Aircrw


member 3
(.125)
(.031)
SERVICE
(.031)
(.01)
Mechs
(.01)
SAR
(.013)
Special
(.013)
Collater
(.006)
BENEFIT
(.031)
member 4
(.125)
EXPER
(.052)
PILOT-E
(.009)
Aircrw-E
(.028)
Mechs-E
(.016)
ROTATION
(.024)
PILOT
(.01)
Aircrw
(.01)
Mechs
(.005)
SERVICE
(.034)
SAR
(.018)
Special
(.01)
Collater
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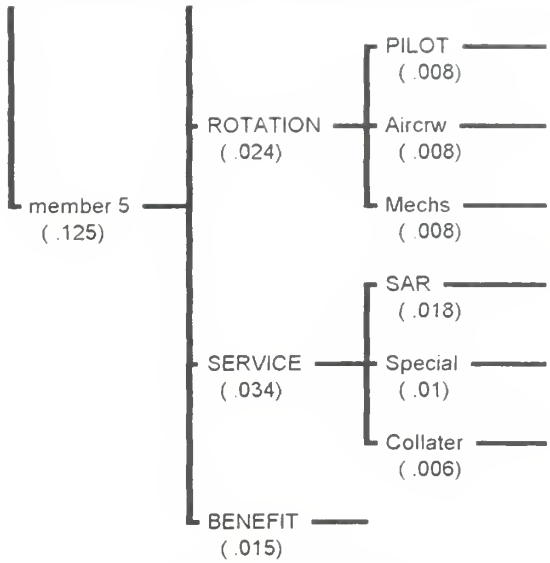
Mechs-E
(.01)



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NAVY SAR	Provide SAR at NAS's with organic navy units (unchanged)
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PILOT	Shore-duty flying billets/SAR career path enhancement
PILOT-E	SAR knowledge Pilot skills & proficiency translation to fleet
ROTATION	Rotation Base provides smooth career flow thru sea shore stations
SAR	Level of SAR support and service provided to the NAS
SERVICE	The level of Service provided to the NAS
Special	The special mission support and service provided to the NAS
member 1	
member 2	
member 3	
member 4	
member 5	

Synthesis of Leaf Nodes with respect to GOAL

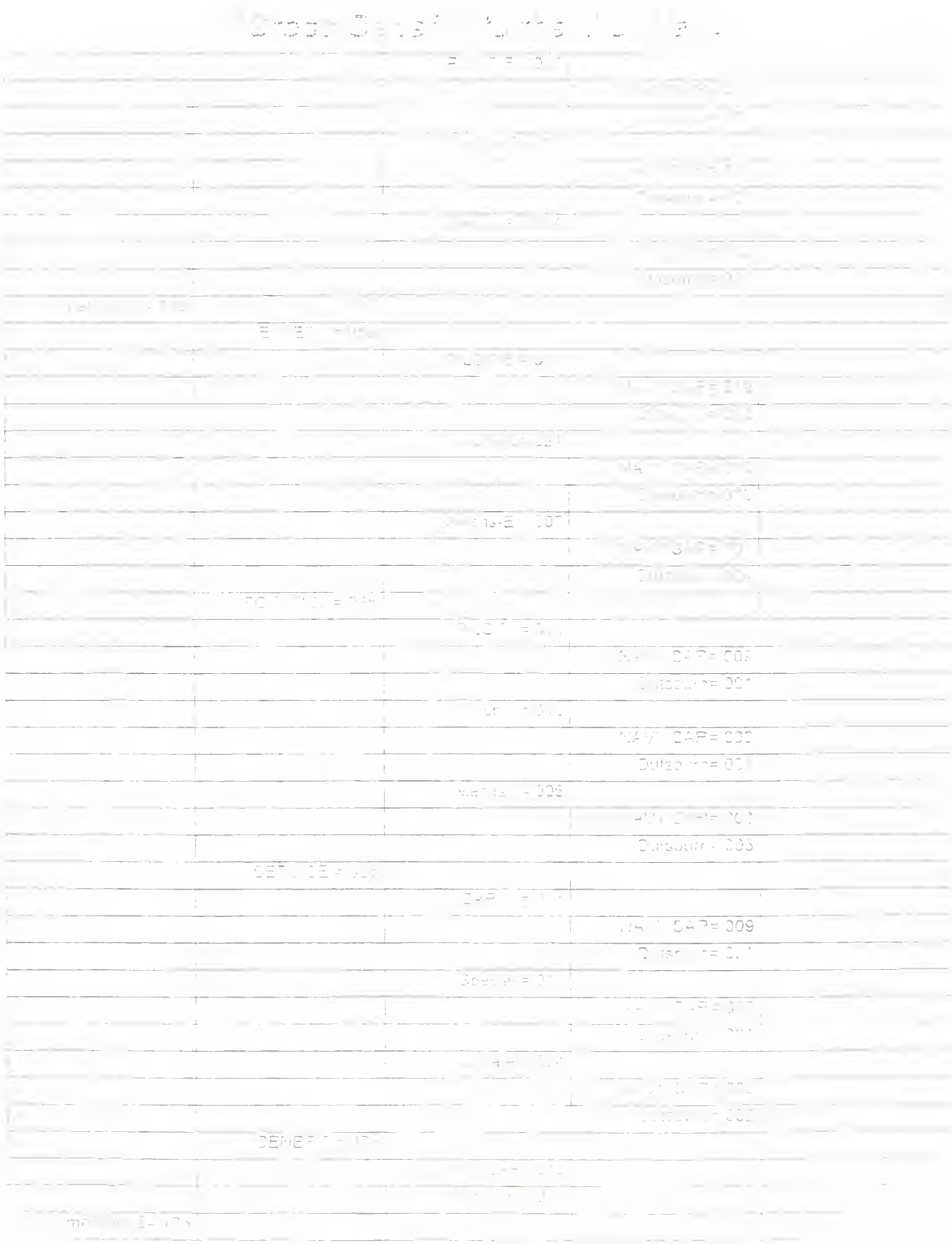
Distributive Mode

OVERALL INCONSISTENCY INDEX = 0.01

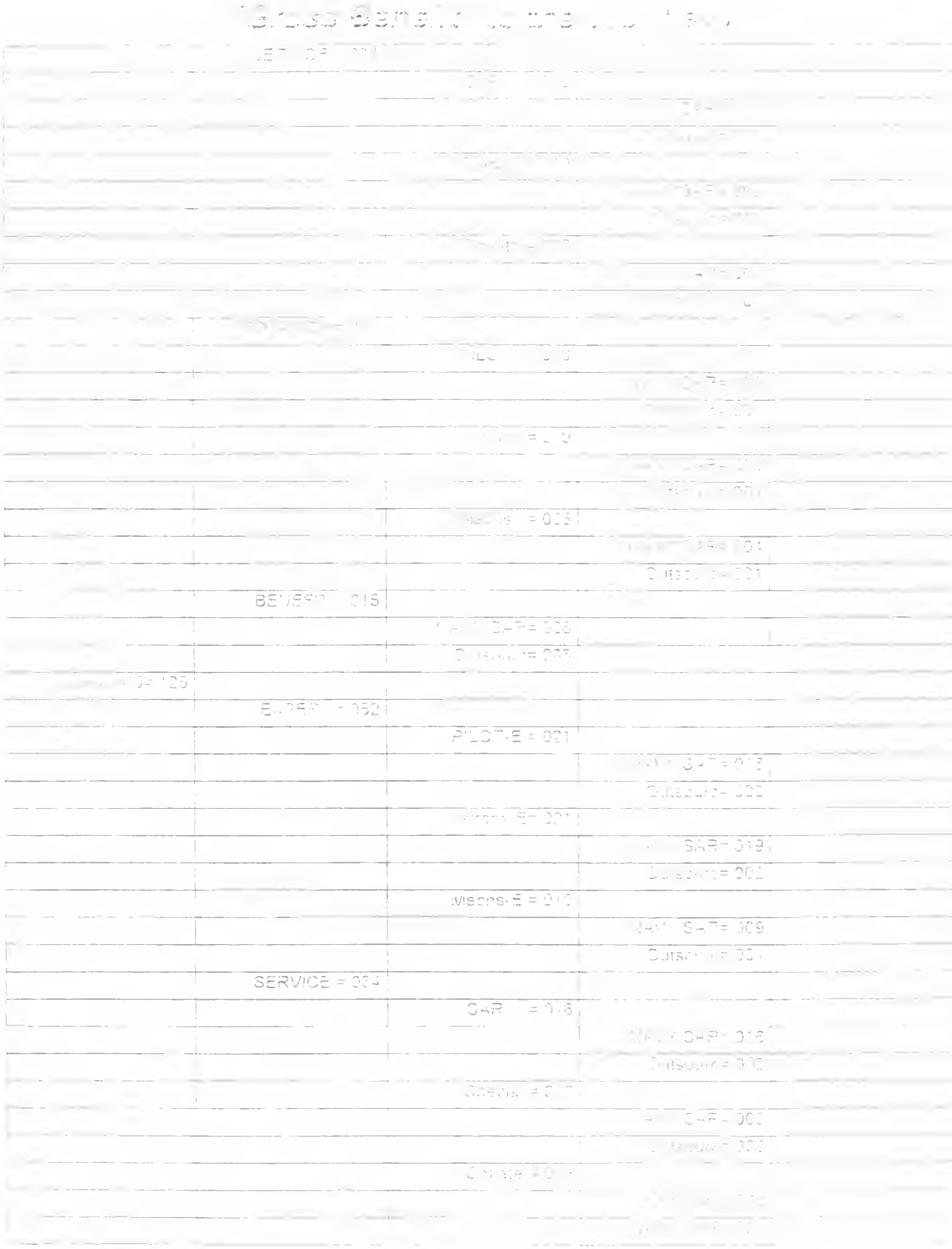
LEVEL	LEVEL 2	LEVEL	LEVEL 4	LEVEL 5
member 3= 123				
	BENEFIT = 152			
		NAVY SAR= 028		
		Outsource = 124		
	SERVICE = 034			
		SAR = 014		
			NAVY SAR= 011	
			Outsource = 003	
		Counter= 014		
			NAVY SAR= 012	
			Outsource = 001	
		Special = 00		
			NAVY SAR= 000	
			Outsource = 00	
	EXPERT = 024			
		aircraft= 010		
			NAVY SAR= 011	
			Outsource= 002	
		PILOT= 007		
			NAVY SAR= 006	
			Outsource< 001	
		Mechs-E = 00		
			NAVY SAR= 003	
			Outsource < 001	
	ROTAT ON = 015			
		Arrcraft = 008		
			NAVY SAR= 007	
			Outsource= 001	
		Mechs = 004		
			NAVY SAR= 003	
			Outsource= 001	
		PILOT = 002		
			NAVY SAR= 002	
			Outsource = 001	
member 7= 125				
	SERVICE = 052			
		SAR = 028		
			NAVY SAR= 025	
			Outsource= 003	


member 6= 125

		[illegible]=015	
			[illegible] SAR= 010
			Outsource= 002
		Marine-E = 005	
			[illegible] SAR= 004
			Outsource= 001
	ROTATION= 021		
		[illegible] = 013	
			[illegible] SAR= 011
			Outsource= 002
		PILOT = 007	
			NAVY SAR= 006
			Outsource= 001
		[illegible] = 004	
			NAVY SAR= 003
			Outsource= 001
	BENEFIT = 017		
		NAVY SAR= 008	
		Outsource= 003	
[illegible]			
	ROTATION= 037		
		[illegible] = 015	
			NAVY SAR= 009
			Outsource= 009
		PILOT = 009	
			NAVY SAR= 005
			Outsource= 005
		Marine = 009	
			NAVY SAR= 005
			Outsource= 005
	SERVICE = 000		
		SAP = 010	
			NAVY SAR= 005
			Outsource= 005
		Special = 010	
			NAVY SAR=.005
			Outsource= 005
		Collater= 010	
			NAVY SAR=.005
			Outsource= 005
	BENEFIT = 030		
		NAVY SAR= 015	
		Outsource= 015	
	EXPEP = 029		



	EXPER = 05		
		PILOT-E = 0	
			NAVY SAR= 01
			Outsource= 002
		Aero-E= 013	
			NAVY SAR= 011
			Outsource= 002
		Mecns-E = 009	
			NAVY SAR= 005
			Outsource= 002
	POSITIONE=01		
		PILOT = 0.6	
			NAVY SAR= 009
			Outsource= 00
		= 0.0	
			NAVY SAR= 009
			Outsource= 001
		Mecns = 010	
			NAVY SAR= 008
			Outsource= 003
	SERVICE = 00		
		SAR = 0.7	
			NAVY SAR= 011
			Outsource= 001
		Supervi = 013	
			NAVY SAR= 011
			Outsource= 002
		Computer= 008	
			NAVY SAR= 005
			Outsource= 001
	BENEFIT = 03		
		NAVY SAR= 015	
		Outsource= 016	
member id= 125			
	EXPER = 052		
		Aerow-E= 023	
			NAVY SAR= 025
			Outsource= 004
		Mecns-E = 016	
			NAVY SAR= 012
			Outsource= 004
		PILOT-E = 009	
			NAVY SAR= 007
			Outsource= 001


SERVICE = 004

"Gross Benefit" to the U.S. Navy

	ROTATION = 024		
		PILOT = 008	
			NAVY SAR= 007
			Outsource 001
		Aircrw = 008	
			NAVY SAR= 007
			Outsource 001
		Mechs = 006	
			NAVY SAR= 007
			Outsource 001
	BENEFIT = 015		
		NAVY SAR= 008	
		Outsource 008	

NAVY SAR .754

Outsourc .246

Abbreviation	Definitio
GOAL	
Aircrw	Flying skills & proficiency SAR knowledge translation to fleet
Aircrw-E	Flying skills & proficiency SAR knowledge/translation to fleet
BENEFIT	The "real time" benefits received by the Navy (overt and covert)
Collater	Collateral duties and assignments accomplished by SAR personnel
EXPER	Experience base from which the Navy can later draw or benefit
Mechs	Shore-duty rate experience/advancement improvements
Mechs-E	Hands-on rate experience advancement benefit/translation to fleet
NAVY SAR	Provide SAR at NAS's with organic navy units (unchanged)
Outsourc	Outsource the SAR mission at NAS's
PILOT	Shore-duty flying billets Career path enhancement
PILOT-E	SAR knowledge/Pilot skills & proficiency translation to fleet
ROTATION	Rotation Base provides smooth career flow thru sea/shore rotation
SAR	Level of SAR support and service provided to the NAS
SERVICE	The level of Service provided to the NAS
Special	The special mission support and service provided to the NAS
member 1	
member 2	
member 3	
member 4	
member 5	

APPENDIX D. ECPRO™ (AHP) OUTPUT-GROUP 1&2 (AVERAGED INPUTS)

"Gross Benefit" to the U.S. Navy GROUP 1

Synthesis of Leaf Nodes with respect to GOAL

Distributive Mode

OVERALL INCONSISTENCY INDEX = 0.11

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
SERVICE = 519				
	SAR = 368			
		NAVY SAR= 327		
		Outsourc= 041		
	Special = 110			
		NAVY SAR= 096		
		Outsourc= 014		
	Collater= 041			
		NAVY SAR= 036		
		Outsourc= 005		
EXPER = 293				
	Aircrw-E= 215			
		NAVY SAR= 192		
		Outsourc= 024		
	Pilot-E = 063			
		NAVY SAR= 055		
		Outsourc= 008		
	Mechs-E = 018			
		NAVY SAR= 015		
		Outsourc= 004		
BENEFIT = 121				
	NAVY SAR= 060			
	Outsourc= 060			
ROTATION= 063				
	Aircrew = 044			
		NAVY SAR= 039		
		Outsourc= 005		
	Pilot = 013			
		NAVY SAR= 011		
		Outsourc= 002		
	Mechs = 006			
		NAVY SAR= 005		
		Outsourc= 001		

NAVY SAR .837

Outsourc .163

Synthesis of Leaf Nodes with respect to GOAL

Distributive Mode

OVERALL INCONSISTENCY INDEX = 0.13

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
SERVICE = .670				
	DAT = .339			
		NAVY SAR= .349		
		Outsource= .021		
	Specialt = .175			
		NAVY SAR= .092		
		Outsource= .027		
	Collegiate= .055			
		NAVY SAR= .044		
		Outsource= .011		
EXPER = .254				
	Aircrew-E= .161			
		NAVY SAR= .138		
		Outsource= .023		
	Pilot-E = .077			
		NAVY SAR= .062		
		Outsource= .015		
	Mecha-E = .016			
		NAVY SAR= .012		
		Outsource= .004		
BENEFIT = .111				
	NAVY SAR= .056			
	Outsource= .056			
ROTATION= .064				
	Aircrew = .045			
		NAVY SAR= .039		
		Outsource= .007		
	Pilot = .014			
		NAVY SAR= .011		
		Outsource= .003		
	Mecha = .005			
		NAVY SAR= .004		
		Outsource= .001		

NAVY SAR .807

Outsourc .193

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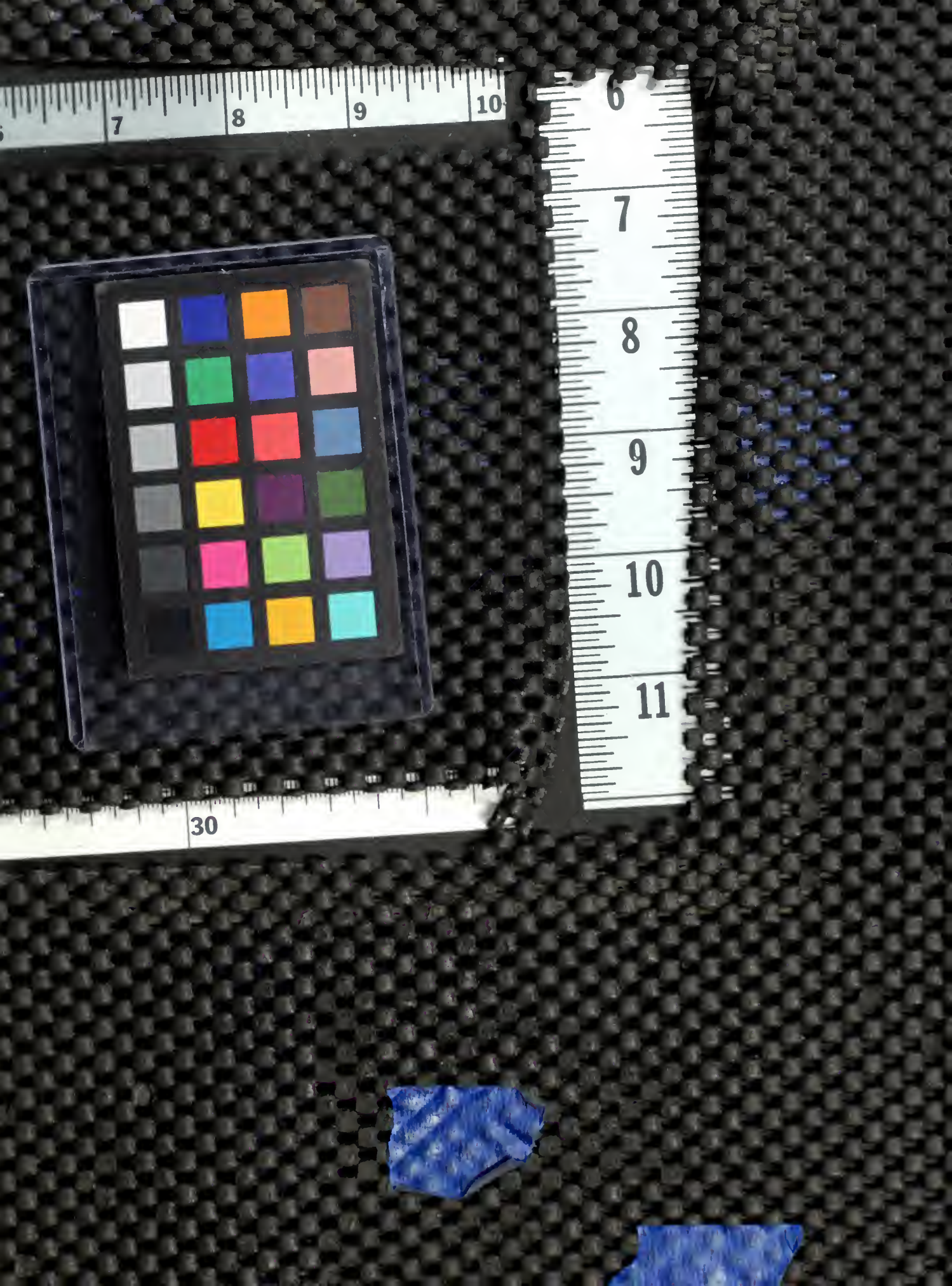
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